

Ichthyofauna (Osteichthyes, Actinopterygii) from tributaries of the Beni and Mamoré rivers in the Llanos de Moxos wetland of the Bolivian Amazon

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Abstract. We conducted ichthyological surveys in the Biata, Geneshuaya, Benicito, and Yata Rivers, as well as Dos Naciones Lagoon. We recorded 182 species, including new records for Bolivia, such as *Jupiaba citrina* Zanata & Ohara, 2009, *Moenkhausia melogramma* Eigenmann, 1908, *Spinipterus* cf. *acsi* Akama & Ferraris, 2011, *Tatia* cf. *gyrina* (Eigenmann & Allen, 1942), *Cetopsidium orientale* (Vari, Ferraris & Keith, 2003), *Nemuroglanis* cf. *furcatus* Ribeiro, Pedroza & Rapp Py-Daniel, 2011, and *Batrochoglanis melanurus* Shibatta & Pavanelli, 2005. Most of these species, reported for the first time in Bolivia, were previously collected in black-clear water streams located in the Upper Amazon and/or the lowlands around the Guiana Shield and Brazilian Shield, far from the study area.

Key words. Black–clear water bodies, geodispersion, turbid rivers

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INTRODUCTION

The wetlands of the Bolivian Amazon, known as the Llanos de Moxos, are located between the Andes and the Brazilian shield in the southwestern Amazon Basin. The region is a vast savanna floodplain of approximately 150,000 km² (Hamilton et al. 2004) and drained by four main sub-basins of the Madeira River Basin: the Beni, Guaporé (Iténez), Madre de Dios, and Mamoré Rivers (Ovando et al. 2016).

While the main rivers of the upper Madeira Basin are thought to be well sampled ichthyologically, some areas gaps remain undersampled. These areas are mainly located in the center of Llanos de Moxos, which, due to its size and remoteness, is poorly collected (Jézéquel et al. 2020). To fill this gap, we conducted a scientific expedition to sample fishes in the tributaries of the Beni and Mamoré Rivers: Biata River, Geneshuaya River, Benicito River, Yata River, and the Dos Naciones Lagoon.

STUDY AREA

The tributaries sampled originate in the northwestern limit of the Inundated Savannas ecoregion, then run northeast into the Cerrado ecoregion, and finally the Amazonian Forests ecoregion until converging with the Beni and Mamoré Rivers. The Inundated Savannas ecoregion presents humid savannahs most affected by annual floods. The Cerrado ecoregion features rain-soaked savannahs and forest islands with trees resistant to frequent burning. The Amazonian Forests ecoregion presents a slightly undulating landscape in the west with outcrops of Precambrian shield in the east. Its terra firme vegetation is made up of (very) tall (30–45 m) evergreen rainforest. In the margins of these tributaries, two habitat types can be distinguished: Varzea: white water floodplains, rich in suspended inorganic material and Igapó: black-clear water bodies, which generally do not carry inorganic material in suspension (Ibisch et al. 2003).

The study area is located in the Beni River megafan, a large, fan-shaped, partial cone of river-laid sediment that develops immediately downstream of the Andean Mountain front. The apex of this cone is where the Beni River exits the mountain mass into an area unconfined by valley walls. These tributaries represent



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previous positions of the Beni River, which has switched from one position to another over time as it builds up the megafan sediment cone (Wilkinson et al. 2006, Wilkinson et al. 2009).

The Benicito River, Yata River, and Dos Naciones Lagoon are located in the Río Yata Ramsar site created in February 2013, with an area of 2,813,229 hectares in the Beni Department of the Plurinational State of Bolivia, and also overlap with a protected area: the Yata Natural Reserve (Ramsar Sites Information Service 2013).

METHODS

Fishes were collected from 17 sites; five from the Biata River: BI-00, BI-01, BI-02, BI-03, BI-04, one Geneshuaya River site: GE-04, five on the Benicito River: BE-01, BE-02, BE-03, BE-04, BE-05, five on the Yata River: YA-01, YA-02, YA-03, YA-04, YA-05, and one in the Dos Naciones Lagoon: 2NA-01. The collections occurred between September 16 to 30, 2023 (Figure 1, Table 1).

We observed that floating meadows were common in the Biata River and Yata River sites (Figure 2A–D), while generally absent in the Benicito River and Geneshuaya River sites (Figure 2E–G).

At each site, we collected fishes over a period of one to two hours. Depending on the environmental condition of the sites and time availability, we used a combination of fishing gear: cast net, hand net, small seine of 5 mm mesh size that were also used to pull out the submerged logs, hook and line, electro-shocker, and gillnets of varying mesh sizes: 15, 25, 35, 50, 60, 80 and 90 mm, dragging the gillnets of small mesh sizes at two sites.

Genus-level identification was primarily based on the key provided by van der Sleen et al. (2018). For species-level identification, a provisional key was created to distinguish the 1,017 species reported in the Bolivian Amazon by Jézéquel et al. (2020 v.2). To develop the provisional key and finalize identifications, we consulted the key provided by Queiroz et al. (2013) for species reported in the Madeira River Basin, as well as Eschmeyer's Catalog of Fishes (Fricke et al. 2024) database for relevant information on the genera and species of interest. Additionally, we contacted reference-work authors and taxonomic group experts when necessary. Finally, we consulted the GBIF occurrence datasets (2024) to confirm our new records had not been previously reported in the Bolivian Amazon or elsewhere in the country.

The collected specimens were fixated in 95% ethanol or 10% formalin followed by preservation in 70% ethanol. All specimens are deposited at the Centro de Investigación de Recursos Acuáticos, Universidad Autónoma del Beni José Ballivián (CIRA-UABJB), in Trinidad, Beni, Plurinational State of Bolivia. Collections were made under license from CAR/MMAYA/VMABCCGDF/DGBAP/UGCE NO 537DI/2023.

RESULTS

The fish surveys resulted in an occurrence dataset of 495 records, of which 452 are preserved specimens. Across the 17 sites, we collected 182 species belonging to 114 genera, 35 families and 10 orders. This dataset includes new Bolivian records of *Jupiaba citrina* Zanata & Ohara, 2009; *Moenkhausia melogramma* Eigen-

Figure 1. Sampling sites in the tributaries of the Beni and Mamoré Rivers. BI: Biata, GE: Geneshuaya, BE: Benicito, YA: Yata, 2NA: Laguna Dos Naciones. no data: areas without information using the HydroBASINS Level7 spatial grain unit (Jézéquel et al. 2020).

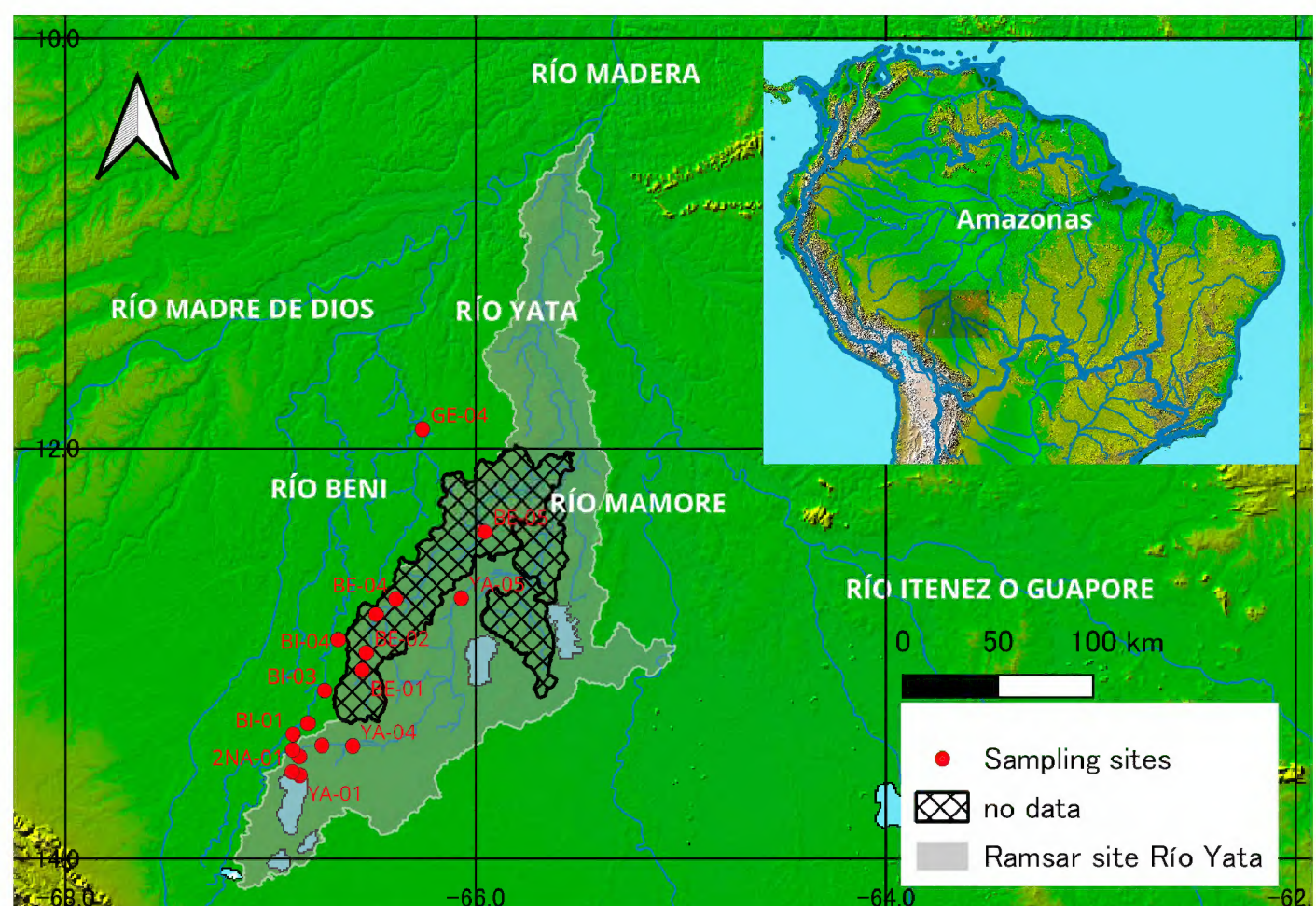


Table 1. Geographic coordinates from the sampling sites in the tributaries of the Beni and Mamoré Rivers, Beni state, Plurinational State of Bolivia.

Site	Locality and Habitat Notes	Date	Latitude	Longitude	Photograph (Fig. 2)
2NA-01	Laguna Dos Naciones; lake	30.IX.2023	13.5753	−66.8963	
BE-01	Benicito; river channel	20.IX.2023	13.0789	−66.5544	E
BE-02	Benicito; intermittent river channel	22.IX.2023	12.9947	−66.5342	
BE-03	Benicito; river channel	21.IX.2023	12.8081	−66.4860	
BE-04	Benicito; river channel	21.IX.2023	12.7337	−66.3900	F
BE-05	Benicito; river channel	16.IX.2023	12.4041	−65.9567	
BI-00	Biata; river channel	29.IX.2023	13.4676	−66.8936	
BI-01	Biata; river channel	29.IX.2023	13.3919	−66.8912	A
BI-02	Biata; intermittent river channel	26.IX.2023	13.3384	−66.8181	
BI-03	Biata; river channel	19.IX.2023	-13.1786	−66.7364	
BI-04	Biata; river channel	20.IX.2023	-12.9304	−66.6709	B
GE-04	Geneshuaya; river channel	17.IX.2023	-11.9052	−66.2601	G
YA-01	Yata; intermittent river channel	27.IX.2023	-13.5918	−66.8584	C
YA-02	Yata; dammed river channel	27.IX.2023	-13.5005	−66.8602	
YA-03	Yata; dammed river channel	28.IX.2023	-13.4466	−66.7506	
YA-04	Yata; river channel	25.IX.2023	-13.4493	−66.6004	
YA-05	Yata; river channel	18.IX.2023	-12.7291	−66.0709	D

Figure 2. Photographs of sampling sites in the tributaries of the Beni and Mamoré Rivers. **A.** BI-01, **B.** BI-04, **C.** YA-01, **D.** YA-05, **E.** BE-01, **F.** BE-04, **G.** GE-04. For details of the sites, see Table 1.



mann, 1908; *Spinipterus* cf. *acsi* Akama & Ferraris, 2011; *Tatia* cf. *gyrina* (Eigenmann & Allen, 1942); *Cetopsidium orientale* (Vari, Ferraris & Keith, 2003); *Nemuroglanis* cf. *furcatus* Ribeiro, Pedroza & Rapp Py-Daniel, 2011; and *Batrochoglanis melanurus* Shibatta & Pavanelli, 2005 (Table 2, Supplemental material Table S1).

Table 2. Fish species sampled from the tributaries of the Beni and Mamoré Rivers in the Llanos de Moxos, wetlands of the Bolivian Amazon. BI: Biata, GE: Genesh-uaya, BE: Benicito, YA: Yata, 2NA: laguna Dos Naciones.

Taxon	BI					GE	BE					YA					2NA	Vouchers CIRA-Ic
	00	01	02	03	04	04	01	02	03	04	05	01	02	03	04	05	01	
OSTEOGLOSSIFORMES																		
Arapaimidae																		
<i>Arapaima gigas</i>																	1*	
CLUPEIFORMES																		
Engraulidae																		
<i>Anchoviella jamesi</i>																	1	1812
CHARACIFORMES																		
Acestrorhynchidae																		
<i>Acestrorhynchus falcatus</i>								1		1	1							1813–1817
<i>Acestrorhynchus falcirostris</i>								1		1								1818–1819
<i>Acestrorhynchus heterolepis</i>											1							1820
<i>Acestrorhynchus microlepis</i>				1*		1			1*	1	1*						1*	1821–1823
<i>Acestrorhynchus pantaneiro</i>				1										1		1		1824–1826
<i>Roestes molossus</i>						1					1			1				1827–1829
Anostomidae																		
<i>Laemolyta proxima</i>											1							1830
<i>Laemolyta taeniata</i>								1*	1*	1	1							1831–1832
<i>Leporinus fasciatus</i>																	1	1833
<i>Leporinus friderici</i>				1*			1					1		1			1*	1834–1837
<i>Pseudanos trimaculatus</i>								1*		1				1				1838–1839
<i>Schizodon fasciatus</i>															1		1*	1840
Chalceidae																		
<i>Chalceus guaporensis</i>										1							1	1841–1842
Characidae																		
<i>Aphyocharax nattereri</i>				1										1			1	1844–1846
<i>Astyanax</i> aff. <i>bimaculatus</i>			1	1		1							1	1	1	1	1	1849–1860
<i>Brachychalcinus copei</i>	1																	1861
<i>Ctenobrycon spilurus</i>	1	1	1		1						1	1		1	1		1	1864–1875
<i>Gymnocorymbus ternetzi</i>												1						1876
<i>Hemigrammus hyanuary</i>						1		1	1		1							1877–1880
<i>Hemigrammus lunatus</i>	1	1	1	1									1		1		1	1881–1887
<i>Holopristis</i> cf. <i>neptunus</i>	1	1	1		1													1888–1891
<i>Holopristis</i> cf. <i>ocellifer</i>						1		1	1*	1	1							1892–1895
<i>Hemigrammus unilineatus</i>	1	1	1															1896–1899
<i>Hyphessobrycon copelandi</i>				1	1										1			1900–1903
<i>Hyphessobrycon eques</i>			1															1904
<i>Hyphessobrycon</i> cf. <i>hasemani</i>																	1	1905
<i>Jupiaba anterior</i>											1							1906
<i>Jupiaba citrina</i> ¶											1							1907
<i>Knodus heteresthes</i>																1		1908
<i>Markiana nigripinnis</i>												1	1	1				1909–1913
<i>Microschemobrycon casiquiare</i>								1										1914

Taxon	BI					GE	BE					YA					2NA	Vouchers CIRA-Ic
	00	01	02	03	04	04	01	02	03	04	05	01	02	03	04	05	01	
<i>Microschemobrycon melanotus</i>											1							1915
<i>Moenkhausia australis</i>			1															1916
<i>Moenkhausia ceros</i>						1		1			1							1917–1920
<i>Moenkhausia collettii</i>						1		1	1	1	1							1921–1926
<i>Moenkhausia dichroua</i>			1								1*					1	1*	1927–1928
<i>Moenkhausia forestii</i>		1		1														1929–1930
<i>Moenkhausia lata</i>																1		1931
<i>Moenkhausia lepidura</i>										1	1							1932–1935
<i>Moenkhausia madeirae</i>								1										1936
<i>Moenkhausia melogramma</i> ¶		1	1	1	1		1	1							1	1	1	1937–1947
<i>Moenkhausia oligolepis</i>	1	1	1	1	1						1							1948–1954
<i>Moenkhausia rondoni</i>			1	1	1							1	1	1	1	1		1955–1965
<i>Moenkhausia sthenostoma</i>																1		1966–1967
<i>Phenacogaster</i> aff. <i>pectinata</i>			1	1	1			1			1							1968–1973
<i>Poptella</i> cf. <i>paraguayensis</i>			1		1						1				1	1		1974–1979
<i>Roeboides descavadensis</i>												1		1	1			1980–1983
<i>Roeboides myersii</i>														1				1984
<i>Serrapinnus kriegi</i>	1	1	1															1985–1988
<i>Serrapinnus microdon</i>						1			1		1							1989–1991
<i>Serrapinnus micropterus</i>	1	1	1									1	1				1	1992–1999
<i>Tetragonopterus chalceus</i>										1*	1							2000
Chilodontidae																		
<i>Caenotropus labyrinthicus</i>										1								2008–2009
Crenuchidae																		
<i>Characidium</i> aff. <i>zebra</i>		1	1										1	1			1	2010–2014
<i>Characidium</i> cf. <i>heinianum</i>				1														2015–2016
<i>Melanocharacidium</i> cf. <i>dispilomma</i>						1	1											2017–2019
Curimatidae																		
<i>Curimata roseni</i>										1								2020
<i>Curimata vittata</i>									1*	1	1							2021–2022
<i>Curimatella alburnus</i>														1	1	1	1*	2023–2025
<i>Curimatella dorsalis</i>														1				2026–2028
<i>Cyphocharax leucostictus</i>						1												2029–2030
<i>Cyphocharax plumbeus</i>										1						1		2031–2032
<i>Cyphocharax spiluropsis</i>			1	1	1						1				1		1	2033–2038
<i>Psectrogaster amazonica</i>														1				2039–2040
<i>Psectrogaster essequibensis</i>										1*								
Erythrinidae																		
<i>Erythrinus erythrinus</i>							1											2041
<i>Hoplerythrinus unitaeniatus</i>							1							1				2042–2043
Gasteropelecidae																		
<i>Carnegiella myersi</i>	1	1	1		1							1		1	1			2057–2063
<i>Carnegiella schereri</i>			1	1	1	1				1	1							2064–2070
<i>Carnegiella strigata</i>			1		1													2071–2072
<i>Gasteropelecus sternicla</i>	1	1	1	1	1							1		1	1			2073–2082
Hemiodontidae																		
<i>Hemiodus</i> aff. <i>unimaculatus</i>								1*	1*	1	1							2083–2084
<i>Hemiodus microlepis</i>								1*	1*	1	1						1*	2085–2086

Taxon	BI					GE	BE					YA					2NA	Vouchers CIRA-Ic
	00	01	02	03	04	04	01	02	03	04	05	01	02	03	04	05	01	
<i>Hemiodus semitaeniatus</i>									1	1	1							2087–2089
Iguanodectidae																		
<i>Bryconops alburnoides</i>											1							2090
<i>Bryconops</i> cf. <i>melanurus</i>			1	1			1	1	1	1	1							2091–2099
<i>Iguanodectes</i> cf. <i>spilurus</i>						1		1		1	1							2100–2103
<i>Piabucus melanostoma</i>								1				1	1*	1				2104–2106
Lebiasinidae																		
<i>Nannostomus digrammus</i>						1					1							2107–2108
<i>Nannostomus trifasciatus</i>			1	1	1			1		1	1							2109–2116
<i>Nannostomus unifasciatus</i>						1				1	1							2117–2120
<i>Pyrrhulina beni</i>						1				1	1							2121–2123
<i>Pyrrhulina</i> cf. <i>brevis</i>		1	1	1	1													2124–2127
<i>Pyrrhulina vittata</i>				1														2128
Serrasalminae																		
<i>Catoprion mento</i>											1							2129
<i>Metynnis lippincottianus</i>				1											1			2130–2131
<i>Metynnis maculatus</i>				1											1			2132–2133
<i>Pygocentrus nattereri</i>											1				1	1*		2134–2135
<i>Serrasalmus maculatus</i>												1			1		1*	2139–2141
Triportheidae																		
<i>Triportheus angulatus</i>											1	1	1	1			1*	2142–2147
GYMNOTIFORMES																		
Apteronotidae																		
<i>Adontosternarchus clarkae</i>																1*		
<i>Platyurosternarchus macrostoma</i>																1		2148
Gymnotidae																		
<i>Gymnotus carapo</i>																1		2150
Hypopomidae																		
<i>Brachyhypopomus bombilla</i>								1		1*						1		2151–2153
<i>Brachyhypopomus regani</i>		1			1	1												2154–2157
Sternopygidae																		
<i>Eigenmannia</i> aff. <i>trilineata</i>				1	1								1	1	1	1	1	2158–2164
SILURIFORMES																		
Aspredinidae																		
<i>Bunocephalus coracoideus</i>		1			1			1										2165–2169
<i>Pseudobunocephalus amazonicus</i>		1			1	1									1	1		2170–2175
<i>Pterobunocephalus depressus</i>					1													2176
Auchenipteridae																		
<i>Auchenipterichthys thoracatus</i>						1				1								2177–2179
<i>Epapterus dispilurus</i>																1		2180
<i>Spinipterus</i> cf. <i>asci</i> ¶						1												2181–2182
<i>Tatia aulopygia</i>								1										2183
<i>Tatia</i> cf. <i>gyrina</i> ¶						1		1										2184–2186
<i>Tatia intermedia</i>		1				1		1										2187–2190
<i>Trachelyopterus</i> cf. <i>ceratophysus</i>				1					1					1				2191–2193
<i>Trachelyopterus coriaceus</i>				1										1				2194–2195
<i>Trachelyopterus</i> cf. <i>galeatus</i>														1				2196
Callichthyidae																		

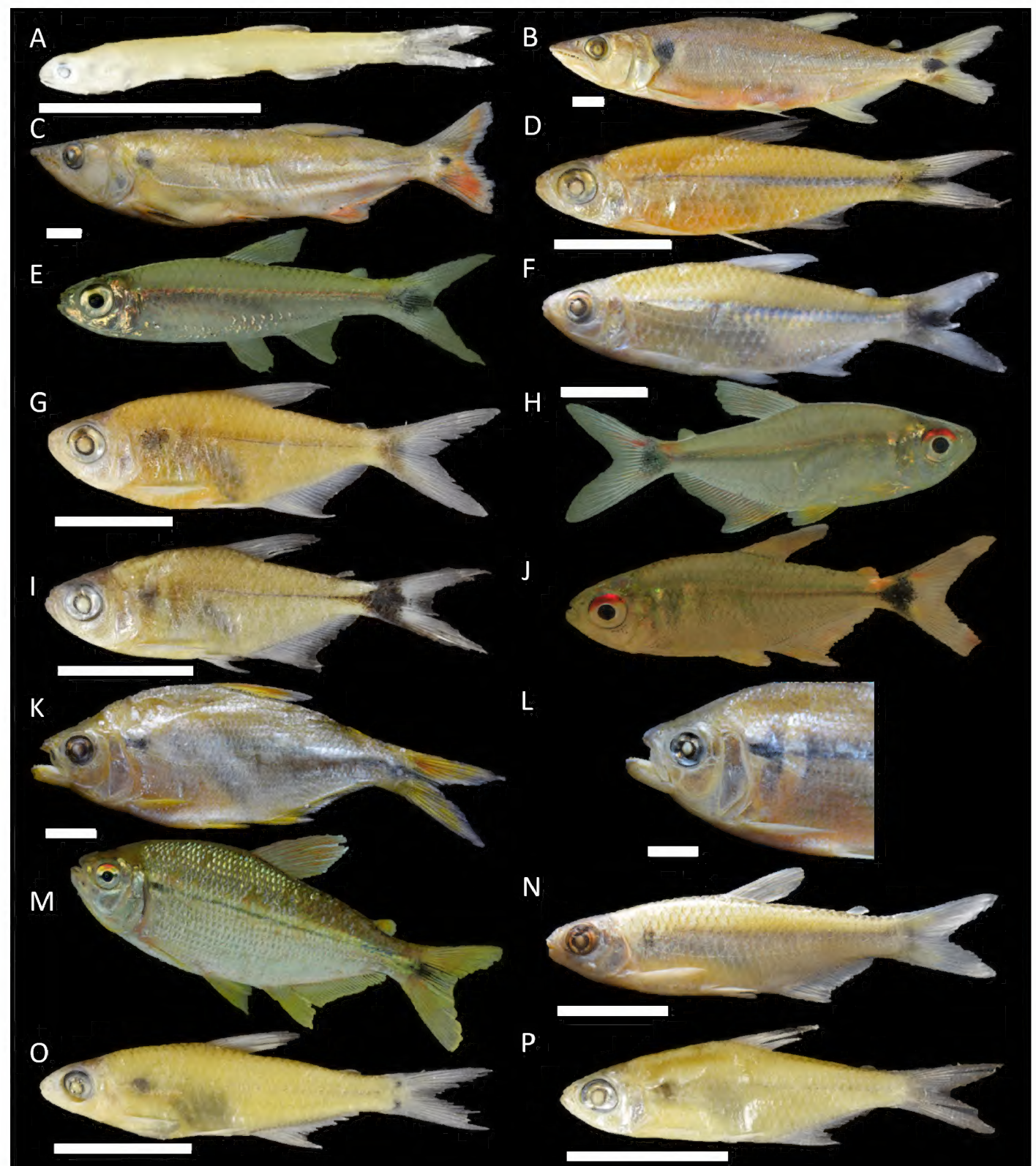
Taxon	BI					GE	BE					YA					2NA	Vouchers CIRA-Ic
	00	01	02	03	04	04	01	02	03	04	05	01	02	03	04	05	01	
<i>Corydoras armatus</i>																1		2197
<i>Corydoras britskii</i>															1			2198
<i>Corydoras geryi</i>													1	1				2199–2203
<i>Corydoras mamore</i>	1																	2204–2205
<i>Corydoras</i> cf. <i>negro</i>	1	1		1														2206–2208
<i>Corydoras splendens</i>													1	1				2209–2212
<i>Hoplosternum littorale</i>													1	1				2213–2216
Cetopsidae																		
<i>Cetopsidium orientale</i> ¶						1												2217
Doradidae																		
<i>Acanthodoras</i> cf. <i>spinosissimus</i>						1		1										2218–2220
<i>Anadoras weddellii</i>													1					2221
<i>Hemidoras</i> cf. <i>morei</i>										1								2223–2224
<i>Hemidoras stuebelii</i>															1			2225
<i>Ossancora asterophysa</i>															1			2226–2227
<i>Ossancora fimbriata</i>						1												2228
<i>Physopyxis lyra</i>							1	1										2229–2230
<i>Platyodoras armatulus</i>				1														2231
<i>Trachydoras paraguayensis</i>															1			2232–2234
Heptapteridae																		
<i>Brachyrhamdia marthae</i>	1																	2235–2236
<i>Imparfinis stictionotus</i>				1														2237–2238
<i>Nemuroglanis</i> cf. <i>furcatus</i> ¶				1														2239
<i>Pimelodella cristata</i>							1	1		1		1			1	1	1	2240–2249
<i>Rhamdia</i> aff. <i>quelen</i>															1			2250
Loricariidae																		
<i>Ancistrus</i> cf. <i>dubius</i>	1														1			2251–2254
<i>Ancistrus</i> cf. <i>hoplogenyis</i>						1	1											2255–2257
<i>Farlowella oxyrryncha</i>				1			1		1*									2258–2261
<i>Hemiodontichthys acipenserinus</i>	1	1	1						1*						1			2262–2265
<i>Hypoptopoma incognitum</i>				1									1	1	1			2266–2270
<i>Hypoptopoma thoracatum</i>	1			1	1										1			2271–2275
<i>Hypostomus cochliodon</i>				1														2276–2277
<i>Hypostomus plecostomus</i>					1								1	1	1			2278–2282
<i>Loricaria</i> aff. <i>cataphracta</i>				1					1*							1	1	2283–2285
<i>Loricariichthys platymetopon</i>															1			2291
<i>Pterygoplichthys</i> cf. <i>pardalis</i>	1*		1		1*								1	1*				2292–2294
<i>Pterygoplichthys lituratus</i>									1*									
<i>Rineloricaria beni</i>	1	1		1	1							1	1	1	1			2295–2308
<i>Rineloricaria</i> cf. <i>castroi</i>																1		2309
<i>Rineloricaria lanceolata</i>				1												1		2310–2311
<i>Rineloricaria phoxocephala</i>							1				1							2312–2314
<i>Sturisoma reisi</i>															1	1		2315–2317
Pimelodidae																		
<i>Hypophthalmus oremaculatus</i>											1							2318
<i>Pimelodus</i> aff. <i>blochii</i>										1			1	1				2319–2321
<i>Pseudoplatystoma punctifer</i>																	1*	

Taxon	BI					GE	BE					YA					2NA	Vouchers CIRA-Ic
	00	01	02	03	04	04	01	02	03	04	05	01	02	03	04	05	01	
Pseudopimelodidae																		
<i>Batrochoglanis melanurus</i> ¶						1*	1											2322
<i>Microglanis</i> cf. <i>poecilus</i>	1				1		1											2323–2326
<i>Microglanis</i> cf. <i>zonatus</i>	1																	2327
Trichomycteridae																		
<i>Ituglanis</i> cf. <i>amazonicus</i>										1								2328
<i>Ituglanis</i> cf. <i>eichhorniarum</i>				1			1											2329–2330
GOBIFORMES																		
Polycentridae																		
<i>Monocirrhus polyacanthus</i>						1				1								2331–2332
SYNBRANCHIFORMES																		
Synbranchidae																		
<i>Synbranchus madeirae</i>	1	1					1						1		1			2333–2337
CICHLIFORMES																		
Cichlidae																		
<i>Acaronia nassa</i>								1*		1	1							2338–2339
<i>Aequidens tetramerus</i>							1			1	1							2340–2342
<i>Apistogramma erythrura</i>						1	1				1							2343–2346
<i>Apistogramma similis</i>	1	1	1	1	1		1	1						1	1		1	2347–2360
<i>Biotodoma cupido</i>						1			1		1							2361–2365
<i>Bujurquina</i> cf. <i>mabelae</i>														1				2366
<i>Chaetobranchopsis australis</i>														1				2367
<i>Cichla</i> cf. <i>pleiozona</i>									1*		1*							
<i>Cichlasoma boliviense</i>		1	1	1								1	1					2368–2373
<i>Crenicara latruncularium</i>											1							2374
<i>Crenicara punctulata</i>				1														2375
<i>Crenicichla cyanonotus</i>					1											1		2376–2377
<i>Geophagus megasema</i>									1									2378
<i>Heros spurius</i>				1														2379
<i>Laetacara dorsigera</i>																	1	2380
<i>Lugubria johanna</i>				1				1										2381–2382
<i>Mesonauta festivus</i>				1	1	1					1				1			2383–2387
<i>Mikrogeophagus altispinosus</i>					1										1			2388–2389
<i>Satanoperca</i> cf. <i>jurupari</i>											1				1			2390–2391
<i>Satanoperca pappaterra</i>							1											2392
<i>Saxatilia santosi</i>	1			1			1								1		1	2393–2399
BELONIFORMES																		
Belonidae																		
<i>Potamorrhaphis eigenmanni</i>				1		1		1	1*		1				1			2400–2404
PERCIFORMES																		
Scianidae																		
<i>Plagioscion squamosissimus</i>																	1*	

* The records of species were based on human observation in the field.

¶ New record for Bolivia.

Figure 3. Some fish species recorded in the study area. **A.** *Anchoviella jamesi* CIRA-Ic 1812, 17.6 mm SL. **B.** *Acestrorhynchus falcatus* CIRA-Ic 1813, 122.0 mm SL. **C.** *Acestrorhynchus pantaneiro* CIRA-Ic 1826, 121.2 mm SL. **D, E.** *Hemigrammus hyanuary* (Preserved and in life) CIRA-Ic 1877, 32.1 mm SL. **F.** *Moenkhausia ceros* CIRA-Ic 1918, 45.7 mm. **G, H.** *Holopristis* cf. *ocellifer* (Preserved and in life) CIRA-Ic 1893, 29.3 mm SL and CIRA-Ic 1892, 34.8 mm SL. **I, J.** *Holopristis* cf. *neptunus* (Preserved and in life) CIRA-Ic 1888, 25.5 mm SL. **K.** *Jupiaba anterior* CIRA-Ic 1906, 78.8 mm SL. **L, M.** *Jupiaba citrina* (Color pattern of preserved specimen and in life) CIRA-Ic 1907, 89.9 mm SL. **N.** *Knodus heteresthes* CIRA-Ic 1908, 34.2 mm SL. **O.** *Microchemobrycon casiquiare* CIRA-Ic 1914, 25.4 mm SL. **P.** *Microchemobrycon melanotus* CIRA-Ic 1915, 22.6 mm SL. Scale bars: 10 mm.



Order Clupeiformes
Family Engraulidae

***Anchoviella jamesi* (Jordan & Seale, 1926)**

Figure 3A

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Laguna Dos Naciones; lake; –13.5753, –66.8963; 30.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 19 specimens, 17.0–19.6 mm SL; CIRA-UABJB, CIRA-Ic 1812.

Identification. Anal-fin origin at the vertical through the posterior margin of the penultimate dorsal-fin ray; number of gill rakers in the lower branch of the first gill arch 15–21; distance between verticals through posterior margin of orbit to posterior margin of upper jaw up to 6% head length (Loeb et al. 2018).

Order Characiformes
Family Acestrorhynchidae

***Acestrorhynchus falcatus* (Bloch, 1794)**

Figure 3B

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; cast net; 1 specimen, 122.0 mm SL; CIRA-UABJB, CIRA-Ic 1813 • same locality; gillnet 15; 2 specimens, 130.0–133.0 mm SL; CIRA-UABJB, CIRA-Ic 1814 • same locality; gillnet 25; 1 specimen, 208.0 mm SL; CIRA-UABJB, CIRA-Ic 1815 • Benicito; river channel; –12.7337, –66.3900; 21.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 141.3 mm SL; CIRA-UABJB, CIRA-Ic 1816 – GENERAL JOSÉ BALLIVIÁN/BENI • Benicito; intermittent river channel; –12.9947,

–66.5342; 22.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet 25; 1 specimen, 226.0 mm SL; CIRA-UABJB, CIRA-Ic 1817 • same locality; obs.; hook and line; 1 specimen.

Identification. Presence of a relatively large and conspicuous humeral blotch. This species can be distinguished from *Acestrorhynchus pantaneiro* Menezes, 1992 (Figure 3C) by having a humeral blotch vertically elongated vs. rounded (Toledo-Piza 2007).

Family Characidae

***Hemigrammus hyanuary* Durbin, 1918**

Figure 3D, E

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 19 specimens, 28.7–33.2 mm SL; CIRA-UABJB, CIRA-Ic 1877 – GENERAL JOSÉ BALLIVIÁN/BENI • Geneshuaya; river channel; –11.9052, –66.2601; 17.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 16 specimens, 25.1–36.2 mm SL; CIRA-UABJB, CIRA-Ic 1878 • Benicito; river channel; –12.8081, –66.4860; 21.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 11 specimens, 26.2–29.1 mm SL; CIRA-UABJB, CIRA-Ic 1879 • Benicito; intermittent river channel; –12.9947, –66.5342; 22.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 9 specimens, 14.8–19.1 mm SL; CIRA-UABJB, CIRA-Ic 1880.

Identification. A relatively inconspicuous humeral blotch and a blotch on the base of the caudal fin; 32 or 33 lateral scales and 5/3 transvers scales; 11–14 branched anal-fin rays (Géry 1977, Lima et al. 2013, Albornoz-Garzón et al. 2019). This species resembles *Moenkhausia ceros* (Figure 3F), from which it is distinguished by having an incomplete lateral line vs. complete, and 11–14 branched anal-fin rays vs. 15–19 (Lima et al. 2013).

***Holopristis cf. ocellifer* (Steindachner, 1882)**

Figure 3G, H

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 14 specimens, 14.7–34.8 mm SL; CIRA-UABJB, CIRA-Ic 1892 • Benicito; river channel; –12.7337, –66.3900; 21.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 11 specimens, 24.5–32.5 mm SL; CIRA-UABJB, CIRA-Ic 1894 – GENERAL JOSÉ BALLIVIÁN/BENI • Geneshuaya; river channel; –11.9052, –66.2601; 17.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 6 specimens, 25.6–29.3 mm SL; CIRA-UABJB, CIRA-Ic 1893 • Benicito; intermittent river channel; –12.9947, –66.5342; 22.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 3 specimens, 18.3–27.2 mm SL; CIRA-UABJB, CIRA-Ic 1895 • Benicito; river channel; –12.8081, –66.4860; 21.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay obs.; hand net; 2 specimens.

Identification. Presence of two humeral blotches and a conspicuous caudal peduncle blotch. This species can be distinguished from *Holopristis cf. neptunus* (Zarske & Géry, 2002) (Figure 3I, J) by having a large rhomboidal caudal spot, which does not extend to the caudal fin, vs. extending in a trident shape to the outer and middle of the caudal fin rays; snout length 5.5–7.3 of head length vs. 4.15–4.47 (Zarske and Géry 2002; Lima et al. 2016). In life, *H. ocellifer* has an orange spot above the dark spot on the caudal peduncle (Lima et al. 2013). The species identified as *H. cf. ocellifer* in this study has red spots above and below the dark spot on the caudal peduncle, which were more visible than those of *H. cf. neptunus*. Additionally, there is an interesting sexual dimorphism, with elongation in the first branched rays of the anal fin (Dagosta, personal communication, 2024-10-01, Lima, personal communication, 2024-12-15).

***Jupiaba anterior* (Eigenmann, 1908)**

Figure 3K

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet 15; 1 specimen, 78.8 mm SL; CIRA-UABJB, CIRA-Ic 1906.

Identification. *Jupiaba* Zanata, 1997 possesses *circuli* on the posterior field of scales (i.e., concentric striae from the focus to the margins of the scales); dentary teeth abruptly decrease in size posteriorly (Terán et al. 2020). This species has the predorsal area of the body covered by skin; a single humeral blotch; a caudal blotch extending from caudal peduncle to caudal-fin rays; 52–53 lateral scales; and 28–32 anal rays (Géry 1977).

***Jupiaba citrina* Zanata & Ohara, 2009**

Figure 3L, M

New record. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; cast net; 1 specimen, 89.9 mm SL; CIRA-UABJB, CIRA-Ic 1907.

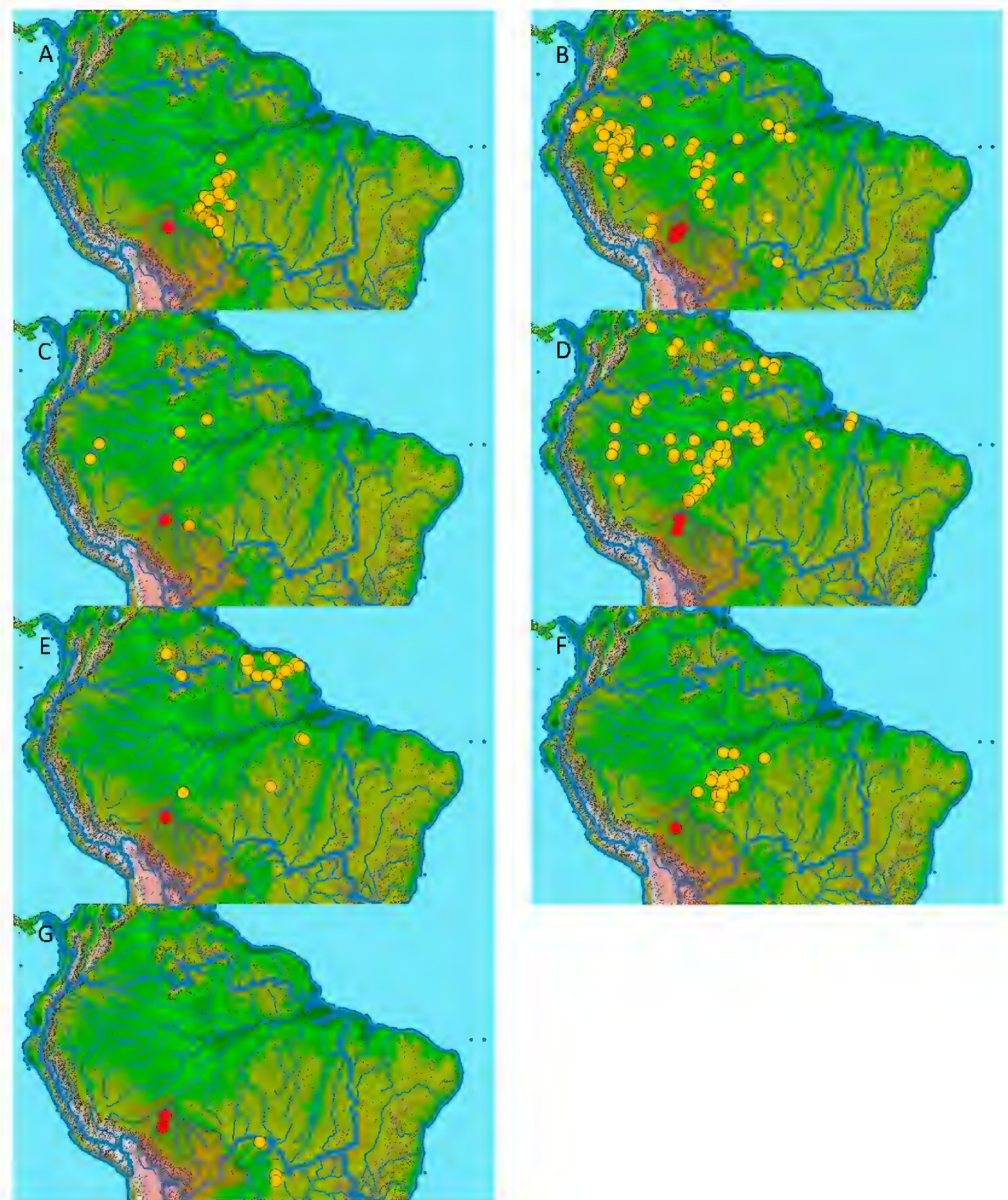


Figure 4. New record in Bolivia (red circle) and known distribution in the Neotropical region (orange circle) based on Jézéquel et al. (2020 v.2) and GBIF.org (2025).

A. *Jupiaba citrina*, **B.** *Moenkhausia melogramma*, **C.** *Spinipterus* cf. *acsi* and the known distribution of the genus *Spinipterus*, **D.** *Tatia* cf. *gyrina*, **E.** *Cetopsidium orientale*, **F.** *Nemuroglanis* cf. *furcatus*, **G.** *Batrochoglanis melanurus*.

Identification. The predorsal area of body covered by skin; two vertically elongated humeral blotches, the anterior usually with a darker median portion forming a horizontally elongated trace pointed anteriorly, and a well-defined dark longitudinal line extending from the second humeral blotch to the caudal peduncle; a horizontally elongated blotch on caudal peduncle that extends continuously to the distal tip of the caudal-fin median rays; 47–51 perforated scales; 10–11 scales between dorsal-fin origin and lateral line, 8–9 between lateral line and origin of pelvic fin, and 24–27 branched anal rays (Netto-Ferreira et al. 2009, Zanata and Ohara 2009).

Remarks. Previously, *J. citrina* was considered possibly endemic to the Rio Aripuanã drainage in the Madeira River Basin. This species was known from small black-clear water igarapé (Zanata and Ohara 2009).

Figure 4A shows a new record in Bolivia and the known distribution of *J. citrina* in the Neotropical region (Jézéquel et al. 2020 v.2, GBIF.org 27 January 2025).

***Knodus heteresthes* (Eigenmann, 1908)**

Figure 3N

Material examined. BOLIVIA – YACUMA/BENI • Yata; river channel; –12.7291, –66.0709; 18.IX.2023; A.R. Echeverría, R.B. Cholina, T. Yunoki, F.R. Cuaniay leg.; seine; 3 specimens, 34.2–38.8 mm SL; CIRA-UABJB, CIRA-Ic 1908.

Identification. Two rows of premaxillary teeth, the inner row with four teeth; a scaled caudal-fin; lateral line complete with 34–35 perforated scales; 5 scales above the lateral line and 3 below; 17 branched rays on anal fin; teeth with five cusps on the premaxilla; and a small rectangular humeral spot (Lima et al. 2013).

***Microchemobrycon casiquiare* Böhlke, 1953**

Figure 3O

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Benicito; intermittent river channel; –12.9947, –66.5342; 22.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 6 specimens, 25.4–28.5 mm SL; CIRA-UABJB, CIRA-Ic 1914.

Identification. The definition of *Microchemobrycon* Eigenmann, 1915 was not hitherto available, and a more specific analysis centered on the genus is still needed (Ohara et al. 2019). This species has a single row of perfectly aligned, similarly sized tricuspid teeth in the premaxilla and dentary; terminal mouth; hyaline fins; incomplete lateral line with 10–11 perforated scales, 17–19 anal fin rays; 4 scales above and 3 below the lateral line; insertion of dark caudal fin rays, forming one or two spots on half-moon shape; and chromatophores at the insertion of the anal fin, which may form a narrow dark band (Lima et al. 2013).

***Microchemobrycon melanotus* (Eigenmann, 1912)**

Figure 3P

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 20.9–22.6 mm SL; CIRA-UABJB, CIRA-Ic 1915.

Identification. A single row of perfectly aligned, similarly sized tricuspid teeth in the premaxilla and dentary; mouth slightly turned upward; dark spot on the dorsal fin; humeral spot absent; incomplete lateral line with 7–10 perforated scales; 21–24 anal fin rays; 5 scales above the lateral line and 3 below (Lima et al. 2013).

***Moenkhausia melogramma* Eigenmann, 1908**

Figure 5A

New record. BOLIVIA – YACUMA/BENI • Yata; river channel; –12.7291, –66.0709; 18.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 10 specimens, 24.5–38.2 mm SL; CIRA-UABJB, CIRA-Ic 1937. GENERAL JOSÉ BALLIVIÁN/BENI • Biata; river channel; –13.1786, –66.7364; 19.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; electro-shocker; 1 specimen, 30.7 mm SL; CIRA-UABJB, CIRA-Ic 1938 • same locality; seine; 20 specimens, 24.1–40.2 mm SL; CIRA-UABJB, CIRA-Ic 1939 • Biata; river channel; –12.9304, –66.6709; 20.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 16 specimens, 22.4–39.8 mm SL; CIRA-UABJB, CIRA-Ic 1940 • Benicito; river channel; –13.0789, –66.5544; 20.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 3 specimens, 31.4–32.7 mm SL; CIRA-UABJB, CIRA-Ic 1941 • Benicito; intermittent river channel; –12.9947, –66.5342; 22.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 11 specimens, 17.5–42.7 mm SL; CIRA-UABJB, CIRA-Ic 1942. • Yata; river channel; –13.4493, –66.6004; 25.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 28.6 mm SL; CIRA-UABJB, CIRA-Ic 1943 • Biata; intermittent river channel; –13.3384, –66.8181; 26.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 4 specimens, 27.4–35.6 mm SL; CIRA-UABJB, CIRA-Ic 1944 • Biata; river channel; –13.3919, –66.8912; 29.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 39.5 mm SL; CIRA-UABJB, CIRA-Ic 1945 • Laguna Dos Naciones; lake; –13.5753, –66.8963; 30.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; cast net; 1 specimen, 25.1 mm SL; CIRA-UABJB, CIRA-Ic 1946 • same locality; seine; 1 specimen, 26.9 mm SL; CIRA-UABJB, CIRA-Ic 1947.

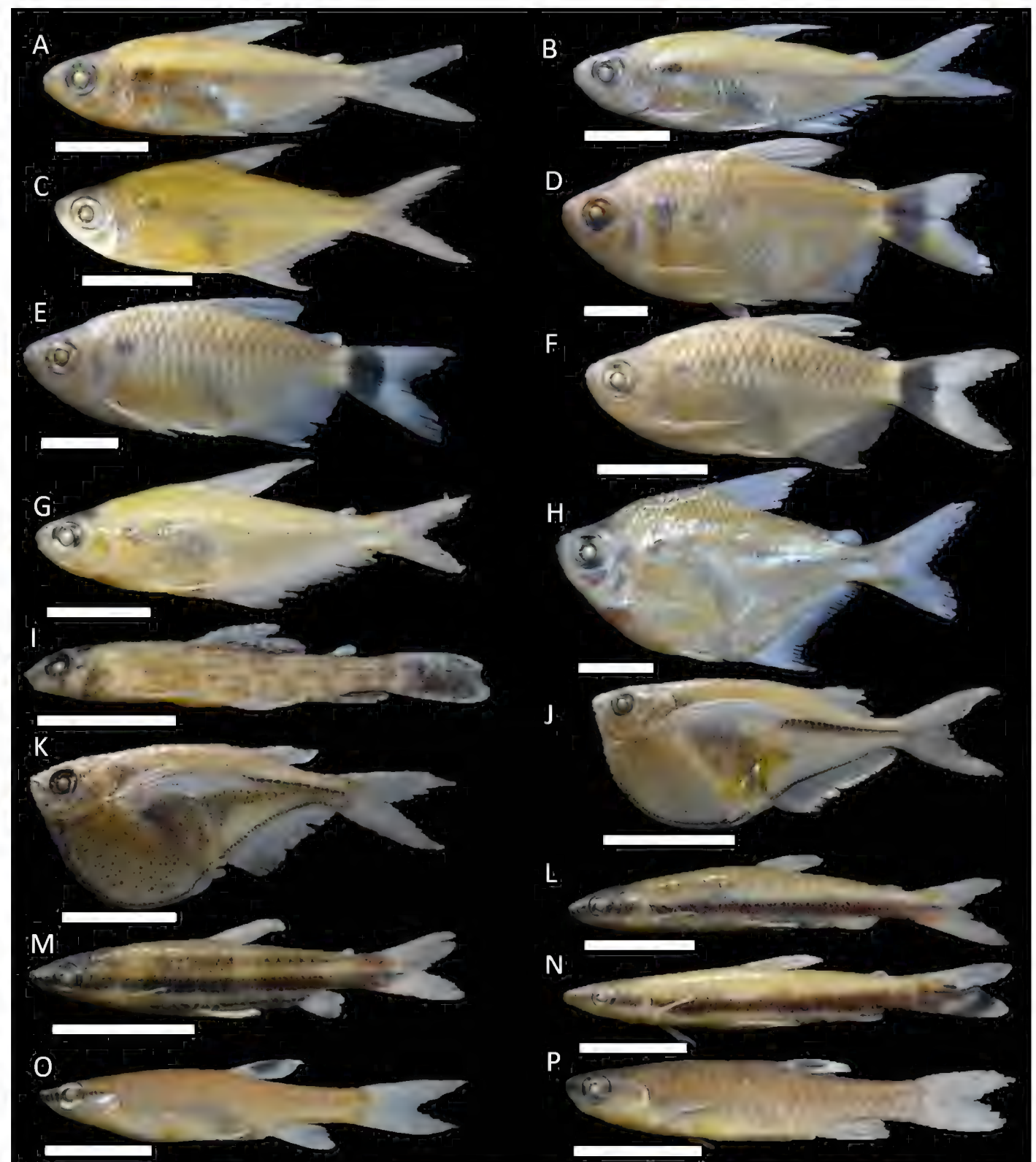
Identification. A well-defined dark longitudinal stripe on the anal-fin base; a narrow midlateral stripe occupying one longitudinal row of scales; usually five or six longitudinal rows of scales above lateral line; 20–26 branched anal-fin rays. This species can be distinguished from *Moenkhausia collettii* (Steindachner, 1882) (Figure 5B) by having two humeral blotches and the first humeral blotch approximately triangular vs. a single horizontally elongated blotch, and usually four longitudinal scale rows between lateral line and pelvic-fin origin vs. three rows (Soares and Bührnheim 2016, Britzke et al. 2018, Soares et al. 2020). This species also resembles *Hemigrammus lunatus* Durbin, 1918 (Figure 5C), from which it is distinguished by having complete lateral line vs. incomplete, and two humeral blotches vs. a small rounded humeral blotch, extending horizontally from fourth through sixth lateral-line scales, and vertically from the fourth through fifth scale rows above the lateral line (Ota et al. 2014, Ota et al. 2019).

Remarks. *Moenkhausia melogramma* is broadly distributed across the western Amazon Basin. This species was collected in moderate to relatively large clearwater terra firme streams as well as black and slightly muddy water terra firme streams (Soares et al. 2020).

Figure 4B shows new records in Bolivia and the known distribution of *M. melogramma* in the Neotropical region (Jézéquel et al. 2020 v.2, GBIF.org 27 January 2025).

Taxonomic remarks. This species is most likely recorded in existing collections as species that are very

Figure 5. Some fish species recorded in the study area. **A.** *Moenkhausia melogramma* CIRA-Ic 1941, 32.7 mm SL. **B.** *Moenkhausia collettii* CIRA-Ic 1925, 38.3 mm SL. **C.** *Hemigrammus lunatus* CIRA-Ic 1883, 24.3 mm SL. **D.** *Moenkhausia oligolepis* CIRA-Ic 1948, 52.5 mm SL. **E.** *Moenkhausia australis* CIRA-Ic 1916, 43.1 mm SL. **F.** *Moenkhausia forestii* CIRA-Ic 1930, 29.4 mm SL. **G.** *Phenacogaster* aff. *pectinata* CIRA-Ic 1972, 35.8 mm SL. **H.** *Poptella* cf. *paraguayensis* CIRA-Ic 1977, 43.4 mm SL. **I.** *Melanocharacidium* cf. *dispilomma* CIRA-Ic 2018, 27.2 mm SL. **J.** *Carnegiella myersi* CIRA-Ic 2063, 24.1 mm SL. **K.** *Carnegiella schereri* CIRA-Ic 2070, 28.0 mm SL. **L.** *Nannostomus digrammus* CIRA-Ic 2107, 32.8 mm SL. **M.** *Nannostomus trifasciatus* CIRA-Ic 2112, 25.3 mm SL. **N.** *Nannostomus unifasciatus* CIRA-Ic 2119, 34.0 mm SL. **O.** *Pyrrhulina beni* CIRA-Ic 2122, 29.7 mm SL. **P.** *Pyrrhulina* cf. *brevis* CIRA-Ic 2125, 28.7 mm SL. Scale bars: 10 mm.



similar in appearance. The occurrence of two species of the genus *Moenkhausia* Eigenmann, 1903: *M. copei* (Steindachner, 1882) and *M. collettii*, and four species of the genus *Hemigrammus* Gill, 1858: *H. changae* Ota, Lima & Hidalgo, 2019, *H. geisleri* Zarske & Géry, 2007, *H. lunatus* and *H. machadoi* Ota, Lima & Pavanelli, 2014, which have a well-defined dark longitudinal stripe on the anal-fin base has been reported for some time in Bolivia (Ota et al. 2014, Jézéquel et al. 2020 v.2, Lima, personal communication, 2024-10-01).

***Moenkhausia oligolepis* (Günther, 1864)**

Figure 5D

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; cast net; 12 specimens, 50.4–64.6 mm SL; CIRA-UABJB, CIRA-Ic 1948 – GENERAL JOSÉ BALLIVIÁN/BENI • Biata; river channel; –13.1786, –66.7364; 19.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; electro-shocker; 3 specimens, 25.1–45.1 mm SL; CIRA-UABJB, CIRA-Ic 1949 • Biata; river channel; –12.9304, –66.6709; 20.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 30.4–57.1 mm SL; CIRA-UABJB, CIRA-Ic 1950 • Biata; intermittent river channel; –13.3384, –66.8181; 26.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 4 specimens, 42.5–49.3 mm SL; CIRA-UABJB, CIRA-Ic 1951 • Biata; river channel; –13.4676, –66.8936; 29.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 3 specimens, 36.6–44.0 mm SL; CIRA-UABJB, CIRA-Ic 1952 • Biata; river channel; –13.3919, –66.8912; 29.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; electro-shocker; 2 specimens, 24.7–43.2 mm SL; CIRA-UABJB, CIRA-Ic 1953 • same locality; seine; 4 specimens, 36.4–44.8 mm SL; CIRA-UABJB, CIRA-Ic 1954.

Identification. A dark blotch on the caudal peduncle preceded by a lighter area; a reticulated body color pattern, formed by a dark pigmentation on the posterior margin of the scales; prepelvic region compressed laterally; 5 rows of scales between the dorsal fin and the lateral line. This species resembles *Moenkhausia*

australis Eigenmann, 1908 (Figure 5E) and *Moenkhausia forestii* Benine, Mariguela & Oliveira, 2009 (Figure 5F), from which it is distinguished by having 28–31 lateral line scales vs. 23–27 in *M. australis*, and 23–26 in *M. forestii*. Finally, this species is distinguished from *M. forestii* by bearing a complete lateral line vs. incomplete (Reia et al. 2019, Reia et al. 2021).

***Phenacogaster* aff. *pectinata* Eigenmann, 1907**

Figure 5G

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 32.6 mm SL; CIRA-UABJB, CIRA-Ic 1968 – GENERAL JOSÉ BALLIVIÁN/BENI • Biata; river channel; –13.1786, –66.7364; 19.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; electro-shocker; 4 specimens, 24.0–26.1 mm SL; CIRA-UABJB, CIRA-Ic 1969 • same locality; seine; 3 specimens, 26.2–33.8 mm SL; CIRA-UABJB, CIRA-Ic 1970 • Biata; river channel; –12.9304, –66.6709; 20.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 29.0 mm SL; CIRA-UABJB, CIRA-Ic 1971 • Benicito; intermittent river channel; –12.9947, –66.5342; 22.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 11 specimens, 30.1–35.8 mm SL; CIRA-UABJB, CIRA-Ic 1972 • Biata; intermittent river channel; –13.3384, –66.8181; 26.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 4 specimens, 28.3–34.1 mm SL; CIRA-UABJB, CIRA-Ic 1973.

Identification. This group can be distinguished from other species of the genus by the following set of characters: humeral spot present only in females, usually oblique and narrow, its width less than half the horizontal diameter of orbit; the caudal peduncle spot absent or restricted to few chromatophores; lateral line complete; 33–42 branched anal fin rays; origin of the anal fin in the vertical that passes close to the origin of the dorsal fin; pre-anal length of 45.1–52.5% of standard length. The populations of the *P. pectinata* complex are in need of revision to determine the real group-specific diversity (Lucena and Malabarba 2010).

***Poptella* cf. *paraguayensis* (Eigenmann, 1907)**

Figure 5H

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet 15; 8 specimens, 47.8–60.0 mm SL; CIRA-UABJB, CIRA-Ic 1974 • same locality; seine; 1 specimen, 41.5 mm SL; CIRA-UABJB, CIRA-Ic 1975 • Yata; river channel; –12.7291, –66.0709; 18.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 3 specimens, 41.5–46.6 mm SL; CIRA-UABJB, CIRA-Ic 1976 – GENERAL JOSÉ BALLIVIÁN/BENI • Biata; river channel; –12.9304, –66.6709; 20.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 6 specimens, 35.3–45.6 mm SL; CIRA-UABJB, CIRA-Ic 1977 • Yata; river channel; –13.4493, –66.6004; 25.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 37.8 mm SL; CIRA-UABJB, CIRA-Ic 1978 • Biata; intermittent river channel; –13.3384, –66.8181; 26.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 42.1–43.9 mm SL; CIRA-UABJB, CIRA-Ic 1979.

Identification. 9 branched dorsal-fin rays; 8–10 scale rows between the lateral line and dorsal-fin origin; 13–14 scale rows around the caudal peduncle; at least 30 branched anal-fin rays (Garcia-Ayala and Benine 2019, 2021, 2023).

Remarks. Previously *P. paraguayensis* was reported from the La Plata River Basin in Brazil, Paraguay and Bolivia. In the Madeira River, this species was reported from the Guaporé (Iténez) and Mamoré rivers in Brazil (GBIF.org 09 January 2025), however the certainty of its presence was classified as ‘to be verified’ by Jézéquel et al. (2020 v.2).

Family Crenuchidae

***Melanocharacidium* cf. *dispilomma* Backup, 1993**

Figure 5I

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Geneshuaya; river channel; –11.9052, –66.2601; 17.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 3 specimens, 23.0–30.4 mm SL; CIRA-UABJB, CIRA-Ic 2017 • same locality; submerged logs; 8 specimens, 22.5–30.3 mm SL; CIRA-UABJB, CIRA-Ic 2018 • Benicito; river channel; –13.0789, –66.5544; 20.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 2 specimens, 27.8–31.3 mm SL; CIRA-UABJB, CIRA-Ic 2019.

Identification. Scaleless area of isthmus not extending to base of pectoral fin; series of scales around the caudal peduncle 12; anal and caudal fins with checkered pigmentation pattern; two discrete bands of pigmentation radiating from orbit over cheek (Backup 1993). Specimens from this area have three scales above the lateral line compared to four.

Family Gasteropelecidae

***Carnegiella myersi* Fernández-Yépez, 1950**

Figure 5J

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Biata; river channel; –12.9304, –66.6709; 20.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 18.7–20.3 mm SL; CIRA-UABJB, CIRA-Ic 2057 • Yata; river channel; –13.4493, –66.6004; 25.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 3 specimens, 19.7–20.8 mm SL; CIRA-UABJB, CIRA-Ic 2058 • Biata; intermittent river channel; –13.3384, –66.8181; 26.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 20.8 mm SL; CIRA-UABJB, CIRA-Ic 2059 • Yata; intermittent river channel; –13.5918, –66.8584; 27.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 11 specimens, 15.7–23.4 mm SL; CIRA-UABJB, CIRA-Ic 2060 • Yata; dammed river channel; –13.4466, –66.7506; 28.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 8 specimens, 15.1–16.8 mm SL; CIRA-UABJB, CIRA-Ic 2061 • Biata; river channel; –13.4676, –66.8936; 29.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 5 specimens, 20.4–23.6 mm SL; CIRA-UABJB, CIRA-Ic 2062 • Biata; river channel; –13.3919, –66.8912; 29.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 7 specimens, 20.8–25.8 mm SL; CIRA-UABJB, CIRA-Ic 2063.

Identification. Body with small dots. This species can be distinguished from *Carnegiella schereri* Fernández-Yépez, 1950 (Figure 5K) by having a relatively elongated body, and 33–36 anal rays vs. less than 31 anal rays (Géry 1977).

Family Lebiasinidae

***Nannostomus digrammus* (Fowler, 1913)**

Figure 5L

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 18 specimens, 16.2–32.8 mm SL; CIRA-UABJB, CIRA-Ic 2107 – GENERAL JOSÉ BALLIVIÁN/BENI • Geneshuaya; river channel; –11.9052, –66.2601; 17.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 20.5–20.6 mm SL; CIRA-UABJB, CIRA-Ic 2108.

Identification. Caudal fin with 10 rays terminating in dorsal lobe and 9 rays in ventral lobe; primary horizontal stripe always, and secondary usually, well developed; tertiary horizontal stripe absent; nocturnal oblique bands present; permanent blotches absent; adipose fin always present; snout length 1.1–1.3 of eye diameter (Weitzman and Cobb 1975; Weitzman 1978).

***Nannostomus trifasciatus* Steindachner, 1876**

Figure 5M

Material examined. BOLIVIA – YACUMA/BENI • • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; cast net; 1 specimen, 19.8 mm SL; CIRA UABJB, CIRA Ic 2109 • same locality; seine; 7 specimens, 20.3–28.1 mm SL; CIRA UABJB, CIRA Ic 2110 • Benicito; river channel; –12.7337, –66.3900; 21.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 12 specimens, 25.3–29.8 mm SL; CIRA UABJB, CIRA Ic 2114 – GENERAL JOSÉ BALLIVIÁN/BENI • Biata; river channel; –13.1786, –66.7364; 19.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; electro shocker; 1 specimen, 25.9 mm SL; CIRA UABJB, CIRA Ic 2111 • same locality; seine; 17 specimens, 21.9–30.3 mm SL; CIRA UABJB, CIRA Ic 2112 • Biata; river channel; –12.9304, –66.6709; 20.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 5 specimens, 22.9–24.8 mm SL; CIRA UABJB, CIRA Ic 2113 • Benicito; intermittent river channel; –12.9947, –66.5342; 22.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 3 specimens, 17.8–19.4 mm SL; CIRA UABJB, CIRA Ic 2115 • Biata; intermittent river channel; –13.3384, –66.8181; 26.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 23.2–23.6 mm SL; CIRA UABJB, CIRA Ic 2116.

Identification. Caudal fin with 10 rays terminating in dorsal lobe and 9 rays in ventral lobe; primary, secondary, and tertiary horizontal stripes all well-developed; nocturnal oblique bands present, exceptionally broad, extending from a vertical line 3 or 4 scale rows posterior from posterior opercular border to posteriorly well past a vertical line from anterior base of dorsal fin, frequently past a vertical from mid base of dorsal fin; posterior oblique band extending posteriorly well beyond posterior end of anal-fin base; permanent blotches absent; eye diameter about 1.0 in interorbital width; anal fin of male and female short, not reaching caudal fin when adpressed to body; adipose fin present or absent; scales in a lateral series 24 to 27 (Weitzman and Cobb 1975, Weitzman 1978).

***Nannostomus unifasciatus* Steindachner, 1876**

Figure 5N

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; cast net; 2 specimens, 29.2–32.7 mm SL; CIRA-UABJB, CIRA-Ic 2117 • same locality; seine; 53 specimens, 21.3–34.9 mm SL; CIRA-UABJB, CIRA-Ic 2118 • Benicito; river channel; –12.7337, –66.3900; 21.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 11 specimens, 29.6–31.9 mm SL; CIRA-UABJB, CIRA-Ic 2120 – GENERAL JOSÉ BALLIVIÁN/BENI • Geneshuaya; river channel; –11.9052, –66.2601; 17.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 4 specimens, 31.8–34.0 mm SL; CIRA-UABJB, CIRA-Ic 2119.

Identification. Principal caudal-fin rays 10/9 but those ending in dorsal lobe 8, those ending in ventral lobe 11 (i.e., the lower lobe of the caudal fin larger than the upper); an ocellus in the upper caudal-fin lobe; primary horizontal stripe very well developed; secondary and tertiary horizontal stripes absent; nocturnal oblique bands absent in preserved specimens; adipose fin present; scales in a lateral series 28 to 30, perforated scales in lateral line 2 to 5 (Weitzman and Cobb 1975, Weitzman 1978).

***Pyrrhulina beni* Pearson, 1924**

Figure 5O

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 30 specimens, 14.6–45.6 mm SL; CIRA-UABJB, CIRA-Ic 2121 • Benicito; river channel; –12.7337, –66.3900; 21.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 38.4–38.5 mm SL; CIRA-UABJB, CIRA-Ic 2123 – GENERAL JOSÉ BALLIVIÁN/BENI • Geneshuaya; river channel; –11.9052, –66.2601; 17.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 29.7–35.2 mm SL; CIRA-UABJB, CIRA-Ic 2122

Identification. Striped color pattern. This species can be distinguished from *Pyrrhulina* cf. *brevis* Steindachner, 1876 (Figure 5P) by having elongated body: body depth 4.45 in the standard length vs. less than 4.25, and 25 longitudinal scales vs. less than 23 (Géry 1977). Specimens of *P.* cf. *brevis* collected in the Biata River present diffuse vertical bands in the caudal fin.

Order Gymnotiformes

Family Hypopomidae

***Brachyhypopomus bombilla* Loureiro & Silva, 2006**

Figure 6A

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Benicito; river channel; –13.0789, –66.5544; 20.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 4 specimens, 69.7–86.8 mm SL; CIRA-UABJB, CIRA-Ic 2151 • Yata; river channel; –13.4493, –66.6004; 25.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 3 specimens, 77.6–92.7 mm SL; CIRA-UABJB, CIRA-Ic 2152 • same locality; seine; 4 specimens, 70.0–88.9 mm SL; CIRA-UABJB, CIRA-Ic 2153 • Benicito; river channel; –12.8081, –66.4860; 21.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay obs.; hand net; 1 specimen.

Identification. Presence of accessory electric organ over opercular region; dorsal surface speckled with small brown chromatophores on light brown background; opercular accessory electric organ overlaid with dense scattering of chromatophores (Crampton et al. 2016). *Brachyhypopomus regani* Crampton, de Santana, Waddell & Lovejoy, 2017 (Figure 6B), only one congener collected in the study area can be distinguished by having the dorsal surface with large dark blotches on pale background, and opercular accessory electric organ overlaid with depigmented skin (Crampton et al. 2016).

Order Siluriformes

Family Auchenipteridae

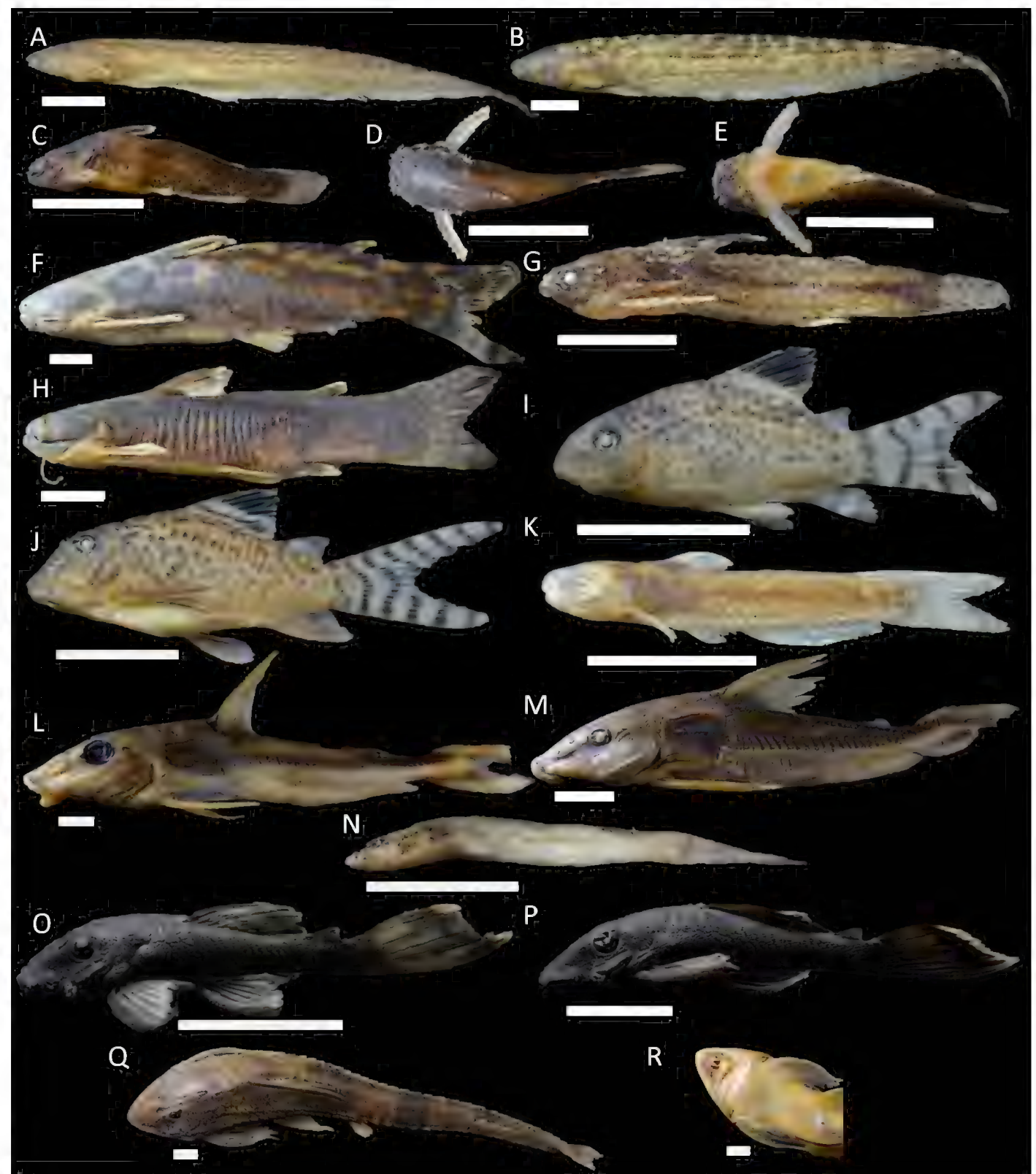
***Spinipterus* cf. *acsi* Akama & Ferraris, 2011**

Figure 6C–E

New record. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Geneshuaya; river channel; –11.9052, –66.2601; 17.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 4 specimenes, 19.1–29.3 mm SL; CIRA-UABJB, CIRA-Ic 2181 • same locality; submerged logs; 2 specimenes, 27.4–29.1 mm SL; CIRA-UABJB, CIRA-Ic 2182.

Identification. Head depressed at some level, mouth straight; maxillary barbel long, extending beyond anterior margin of orbit; two pairs of mental barbels; caudal fin truncated; lower and upper jaws ending on same vertical line; antorbital and suborbital ossified tubules spiny; three rows of serrae on anterior margin

Figure 6. Some fish species recorded in the study area. **A.** *Brachyhypopomus bombilla* CIRA-Ic 2151, 81.4 mm SL. **B.** *Brachyhypopomus regani* CIRA-Ic 2157, 114.9 mm SL. **C–E.** *Spinipterus* cf. *acsi* (Lateral, dorsal and ventral) CIRA-Ic 2181, 22.4 mm SL. **F.** *Tatia aulopygia* CIRA-Ic 2183, 100.7 mm SL. **G.** *Tatia* cf. *gyrina* CIRA-Ic 2186, 34.5 mm SL. **H.** *Tatia intermedia* CIRA-Ic 2190, 60.0 mm SL. **I.** *Corydoras mamore* CIRA-Ic 2205, 15.5 mm SL. **J.** *Corydoras* cf. *negro* CIRA-Ic 2208, 24.5 mm SL. **K.** *Cetopsidium orientale* CIRA-Ic 2217, 21.8 mm SL. **L.** *Hemiodoras* cf. *morei* CIRA-Ic 2223, 127.7 mm SL. **M.** *Hemiodoras stuebelii* CIRA-Ic 2225, 87.9 mm SL. **N.** *Nemuroglanis* cf. *furcatus* CIRA-Ic 2239, 22.6 mm SL. **O.** *Ancistrus* cf. *dubius* CIRA-Ic 2252, 28.1 mm SL. **P.** *Ancistrus* cf. *hoplogenyis* CIRA-Ic 2255, 36.4 mm SL. **Q, R.** *Loricaria* aff. *cataphracta* (Dorsal and ventral) CIRA-Ic 2284, 186.2 mm SL. Scale bars: 10 mm.



of dorsal-fin spine; body moderately elongated, anal fin with 13–20 total rays; four rows of serrae on pectoral-fin spine (anterior, posterior, dorsal and ventral); posterior margin of dorsal-fin spine smooth; colour pattern with brown background with small dark blotches over the body (Akama and Ribeiro 2013, Calegari et al. 2019, Rocha et al. 2019).

Remarks. The genus *Spinipterus* Akama & Ferraris, 2011 was described based only on the holotype of *S. acsi* Akama & Ferraris, 2011 from a creek tributary to the Nanay River in Peru, then a second specimen was recognised from the Rio Juruá, Brazil (Calegari et al. 2018). Recent description of *Spinipterus mojiri* Rocha, Rossoni, Akama & Zuanon, 2019 was also based on the few specimens and similarly reported from upper Amazon in Peru and Brazil. The specimens of this genus were also reported from the Rio Caracol, a creek tributary from the right margin of the Madeira River, but its taxonomic identity is still uncertain (Akama and Ribeiro 2013).

Figure 4C shows a new record in Bolivia and the known distribution of the genus *Spinipterus* in the Neotropical region (Jézéquel et al. 2020 v.2, GBIF.org 30 January 2025).

***Tatia aulopygia* (Kner, 1858)**

Figure 6F

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Benicito; river channel; –13.0789, –66.5544; 20.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 5 specimens, 66.2–100.7 mm SL; CIRA-UABJB, CIRA-Ic 2183.

Identification. Outer mental barbel longer than inner (Calegari et al. 2019); a short cranial fontanel, with the opening restricted to the frontals; a genital papilla with thick flap of skin around the deferent duct in males; third nuchal plate well projected laterally with a curved tip (Sarmiento-Soares and Martins-Pinheiro 2008).

***Tatia cf. gyrina* (Eigenmann & Allen, 1942)**

Figure 6G

New record. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Geneshuaya; river channel; –11.9052, –66.2601; 17.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 8 specimens, 17.5–25.7 mm SL; CIRA-UABJB, CIRA-Ic 2184 • same locality; submerged logs; 1 specimen, 18.7 mm SL; CIRA-UABJB, CIRA-Ic 2185 • Benicito; river channel; –13.0789, –66.5544; 20.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 2 specimens, 25.5–34.5 mm SL; CIRA-UABJB, CIRA-Ic 2186.

Identification. Outer mental barbel longer than inner (Calegari et al. 2019); elongate postcleithral process, sometimes as long as head length; a whitish ground color pattern with brown spots, pattern mottled or with irregular stripes; ventral surface of head covered with short brown irregular stripes; body with a characteristic dark band along lateral line; a small adult size of less than 40 mm SL (Sarmiento-Soares and Martins-Pinheiro 2008).

Remarks. *Tatia gyrina* occurs in the upper and central Amazon, in Peru, Colombia and Brazil, also in rivers of northern Surinam. In the Madeira River, this species was reported from the Rio Pacaás-Novos and Rio Jaciparaná, also from the igarapé Aponiã, a creek tributary from the left margin of the Madeira River. This species is typically associated with black-clear water bodies (Sarmiento-Soares and Martins-Pinheiro 2008, Akama and Ribeiro 2013).

Figure 4D shows new records in Bolivia and the known distribution of *T. gyrina* in the Neotropical region (Jézéquel et al. 2020 v.2, GBIF.org 27 January 2025).

***Tatia intermedia* (Steindachner, 1877)**

Figure 6H

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Geneshuaya; river channel; –11.9052, –66.2601; 17.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 14 specimens, 30.1–69.4 mm SL; CIRA-UABJB, CIRA-Ic 2187 • same locality; submerged logs; 10 specimens, 32.0–65.4 mm SL; CIRA-UABJB, CIRA-Ic 2188 • Benicito; intermittent river channel; –12.9947, –66.5342; 22.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; submerged logs; 2 specimens, 48.4–53.9 mm SL; CIRA-UABJB, CIRA-Ic 2189 • Biata; river channel; –13.4676, –66.8936; 29.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; cast net; 1 specimen, 60.0 mm SL; CIRA-UABJB, CIRA-Ic 2190.

Identification. Outer mental barbel longer than inner (Calegari et al. 2019); wide elliptical cranial fontanel; short postcleithral process not reaching vertical through origin of dorsal fin; body coloration variable, usually with elliptical spots along sides of body, large specimens with faint spots; or color pattern uniformly pale brown; caudal fin with small spots or pale brown (Sarmiento-Soares and Martins-Pinheiro 2008).

Family Callichthyidae

***Corydoras mamore* Knaack, 2002**

Figure 6I

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Biata; river channel; –13.4676, –66.8936; 29.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 1 specimen, 16.0 mm SL; CIRA-UABJB, CIRA-Ic 2204 • same locality; seine; 1 specimen, 15.5 mm SL; CIRA-UABJB, CIRA-Ic 2205.

Identification. Short snout; conical serrations on posterior margin of pectoral spine; irregular small black spots (Tencatt and Pavanelli 2015, Bono et al. 2019); a dorsal spot (Knaack 2004).

***Corydoras cf. negro* Knaack, 2004**

Figure 6J

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Biata; river channel; –13.1786, –66.7364; 19.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 24.5 mm SL; CIRA-UABJB, CIRA-Ic 2206 • Biata; river channel; –13.4676, –66.8936; 29.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 3 specimens, 19.0–20.0 mm SL; CIRA-UABJB, CIRA-Ic 2207 • Biata; river channel; –13.3919, –66.8912; 29.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 6 specimens, 15.5–31.0 mm SL; CIRA-UABJB, CIRA-Ic 2208.

Identification. Long snout; branch of the temporal sensory canal at sphenotic, which gives rise to the supraorbital canal, with two pores; ventral surface of head and trunk densely covered by small, not coalescent platelets; long opercular membrane, covering anteroventral portion of cleithrum (Tencatt et al. 2020). Juveniles have mottled sides that are irregular in size and shape and temporary dorsal spot (Knaack 2004).

Family Cetopsidae

***Cetopsidium orientale* (Vari, Ferraris & Keith, 2003)**

Figure 6K

New record. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Geneshuaya; river channel; –11.9052, –66.2601; 17.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 4 specimens, 15.6–22.9 mm SL; CIRA-UABJB, CIRA-Ic 2217.

Identification. First pectoral-fin ray spinous for basal one-half of its length; dorsal fin with first ray spinous; pigmentation on body consisting of, dark, stellate chromatophores (when expanded); tip of adpressed pelvic fin falling short of, or reaching, vent but always falling short of origin of anal fin; vent located proximate to base of anterior most anal-fin ray; dark pigmentation on body distributed over all of dorsal and lateral surfaces; dorsal and ventral portions of post dorsal region of body running in parallel (Vari et al. 2005).

Remarks. Previously, *C. orientale* was reported from the coastal rivers in Guyana, Suriname and French Guiana, with two isolated occurrences in the Xingu and Araguaia rivers (Vari et al. 2005). The occurrence in the Madeira River made this species the most widely distributed in the genus *Cetopsidium* Vari, Ferraris & de Pinna, 2005, however this species was only reported from the igarapé Caracol (de Pinna 2013).

Figure 4E shows a new record in Bolivia and the known distribution of *C. orientale* in the Neotropical region (Jézéquel et al. 2020 v.2, GBIF.org 27 January 2025).

Family Doradidae

***Hemidoras cf. morei* (Steindachner, 1881)**

Figure 6L

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.7337, –66.3900; 21.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet 15; 1 specimen, 127.7 mm SL; CIRA-UABJB, CIRA-Ic 2223 • same locality; gillnet 25; 2 specimens, 120.3–123.6 mm SL; CIRA-UABJB, CIRA-Ic 2224.

Identification. Midlateral bony scutes, 32–35; eyes relatively large (orbital diameter approximately the size of the interorbital space); no pre-adipose dermal scutes (Steindachner 1881). Birindelli and Sousa (2013), Sabaj and Arce (2021) did not recognize the presence of this species in Madeira River Basin. *Hemidoras stuebelii* (Steindachner, 1882) (Figure 6M), only one congener recollected in the study area can be distinguished by having 29–31 midlateral bony scutes, and relatively small eyes (orbital diameter 1.4–2.0 times in interorbital space) (Birindelli and Sousa 2013).

Family Heptapteridae

***Nemuroglanis cf. furcatus* Ribeiro, Pedroza & Rapp Py-Daniel, 2011**

Figure 6N

New record. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Biata; river channel; –13.1786, –66.7364; 19.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 22.1–22.6 mm SL; CIRA-UABJB, CIRA-Ic 2239.

Identification. The majority of heptapterid genera are uniquely characterized by osteological features that are not easily seen from external observation, and some of the external traits valuable in identifying heptapterid genera are difficult to observe (e.g., counts of pores of the laterosensory system; Bockmann and Slobodian 2018). Dorsal fin with 5–6 branched rays; posterior process of the supraoccipital very short, distant from the anterior nuchal plate (located immediately anterior to the dorsal fin); first ray (undivided) of dorsal and pectoral fins not projecting beyond adjacent rays, or projecting as a short filament; first ray of the pectoral fin long, not forming a spine, having only a stiffened but fragile basal region; mandibular adductor muscles not hypertrophied, restricted to the face; caudal fin forked; generally dark brown color when alive; ventral lobe of caudal fin as long as dorsal lobe or shorter; pectoral fin with 7 branched rays; caudal fin forked, with dorsal and ventral lobes well separated from each other; with 6–7, usually 7 branched rays in the dorsal lobe and 6–7, usually 6 branched rays in the ventral lobe (Bockmann and Slobodian 2013).

Remarks. *Nemuroglanis furcatus* was described based on the specimens collected from a clear water tributary of the Rio Aripuanã, Madeira River Basin (Ribeiro et al. 2011). There are several lots of specimens collected from different tributaries of the Madeira River in the State of Rondônia, Brazil (Bockmann and Slobodian 2013).

Figure 4F shows a new record in Bolivia and the known distribution of *N. furcatus* in the Neotropical region (Jézéquel et al. 2020 v.2, GBIF.org 30 January 2025).

Family Loricariidae

***Ancistrus cf. dubius* Eigenmann & Eigenmann, 1889**

Figure 6O

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Yata; dammed river channel; –13.4466, –66.7506; 28.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; cast net; 1 specimen, 64.3 mm SL; CIRA-UABJB, CIRA-Ic 2251 • Biata; river channel; –13.4676, –66.8936; 29.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 2 specimens, 26.3–28.1 mm SL; CIRA-UABJB, CIRA-Ic 2252 • same locality; seine; 1 specimen, 39.5 mm SL; CIRA-UABJB, CIRA-Ic 2253 • same locality; submerged logs; 1 specimen, 29.4 mm SL; CIRA-UABJB, CIRA-Ic 2254.

Identification. Adipose fin present; 7 branched rays in the dorsal fin; bicuspid teeth; 4–8 preadipose plates; mandibular ramus length which fits 3.1–4.0 times in the interorbital width; caudal fin is lunate; body and fins are dark brown or black with small white dots (Provenzano and Barriga-Salazar 2018, Bifi et al. 2019, Bifi and Ortega 2020). *Ancistrus cf. hoplogenyis* (Günther, 1864) (Figure 6P), only congener recollected in the study area can be distinguished by having oblique truncate caudal fin, and very small white dots on the body and fins (Provenzano and Barriga-Salazar 2018, Bifi et al. 2019, Bifi and Ortega 2020). The species identified as *A. cf. dubius* in this study has the caudal fin with white tips of principal rays, while *A. cf. hoplogenyis* has the caudal fin with white margin.

***Loricaria aff. cataphracta* Linnaeus, 1758**

Figure 6Q, R

Material examined. BOLIVIA – YACUMA/BENI • Yata; river channel; –12.7291, –66.0709; 18.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet15; 1 specimen, 158.4 mm SL; CIRA-UABJB, CIRA-Ic 2283 • GENERAL JOSÉ BALLIVIÁN/BENI • Biata; intermittent river channel; –13.3384, –66.8181; 26.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet25; 1 specimen, 186.2 mm SL; CIRA-UABJB, CIRA-Ic 2284 • Laguna Dos Naciones; lake; –13.5753, –66.8963; 30.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; cast net; 1 specimen, 47.1 mm SL; CIRA-UABJB, CIRA-Ic 2285 • Benicito; river channel; –12.8081, –66.4860; 21.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay obs.; gillnet 15; 20 specimens.

Identification. Abdominal plates tightly joined and completely covering the median abdominal space and pectoral girdle (Isbrücker 1981, Londoño-Burbano et al. 2023).

***Loricariichthys platymetopon* Isbrücker & Nijssen, 1979**

Figure 7A, B

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Yata; dammed river channel; –13.4466, –66.7506; 28.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; cast net; 1 specimen, 122.2 mm SL; CIRA-UABJB, CIRA-Ic 2291.

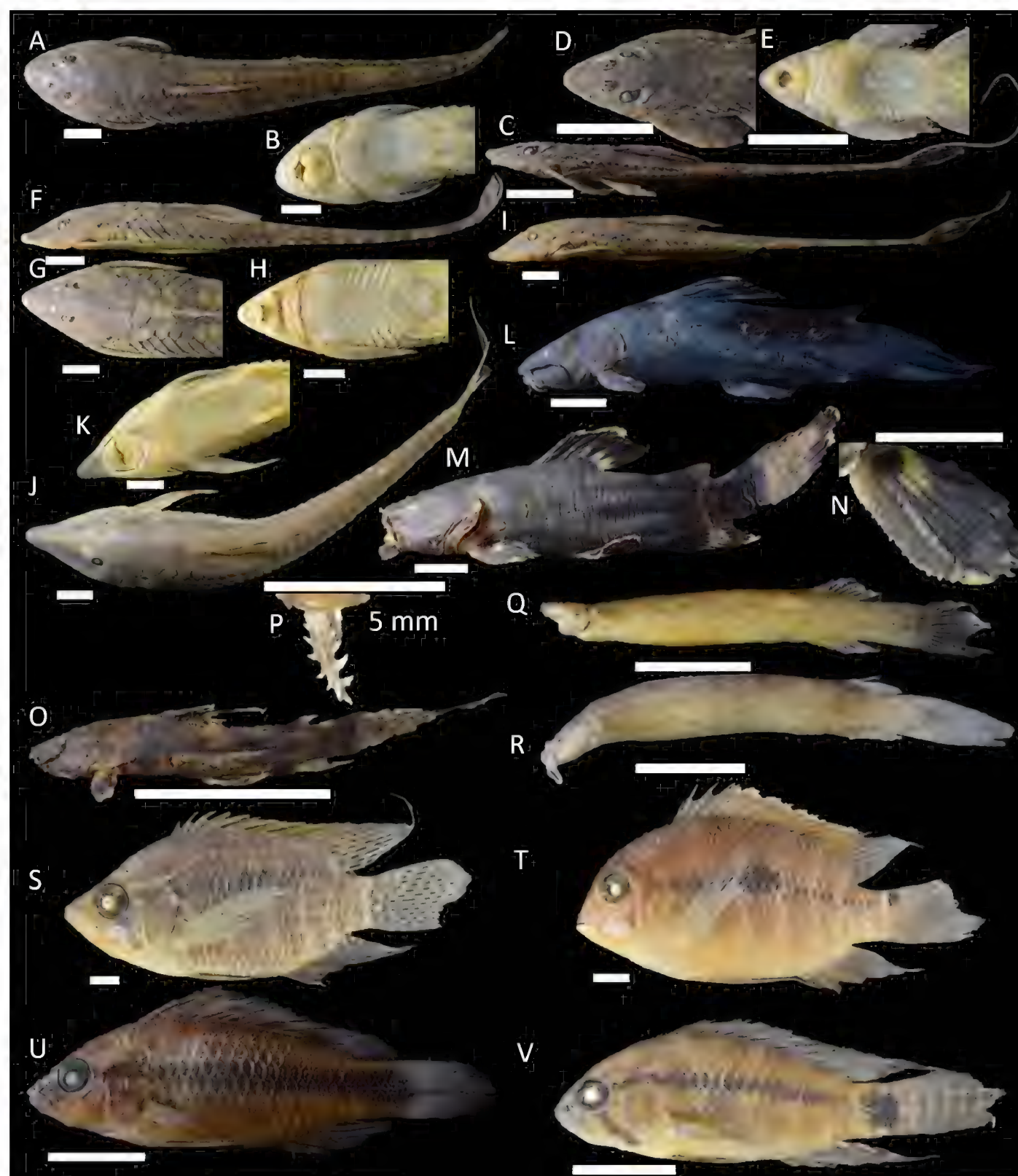
Identification. A black spot on the exposed part of the cleithrum evident; two sets of mid abdominal plates followed by one; greater inter orbital distance (Paixão 2012).

***Rineloricaria beni* (Pearson, 1924)**

Figure 7C–E

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Biata; river channel; –13.1786, –66.7364; 19.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; electro-shocker; 7 specimens, 48.8–68.2 mm SL; CIRA-UABJB, CIRA-Ic 2295 • same locality; seine; 18 specimens, 50.3–67.6 mm SL; CIRA-UABJB, CIRA-Ic 2296 • Biata; river channel; –12.9304, –66.6709; 20.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 57.5–59.3 mm SL; CIRA-UABJB, CIRA-Ic 2297 • Yata; river channel; –13.4493, –66.6004; 25.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 8 specimens, 43.9–70.6 mm SL; CIRA-UABJB, CIRA-Ic 2298 • same locality; seine; 1 specimen, 57.6 mm SL; CIRA-UABJB, CIRA-Ic 2299 • Yata; intermittent river channel; –13.5918, –66.8584; 27.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 67.5 mm SL; CIRA-UABJB, CIRA-Ic 2300 • Yata; dammed river channel; –13.5005, –66.8602; 27.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 42.1–52.6 mm SL; CIRA-UABJB, CIRA-Ic 2301 • Yata; dammed river channel; –13.4466, –66.7506; 28.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; cast net; 1 specimen, 58.5 mm SL; CIRA-UABJB, CIRA-Ic 2302 • same locality; hand net; 11 specimens, 34.4–53.2 mm SL; CIRA-UABJB, CIRA-Ic 2303 • same locality; seine; 2 specimens, 60.4–66.6 mm SL; CIRA-UABJB, CIRA-Ic 2304 • Biata; river channel; –13.4676, –66.8936; 29.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 6 specimens, 38.3–71.9 mm SL; CIRA-UABJB, CIRA-Ic 2305 • same locality; seine; 1 specimen, 53.7 mm SL; CIRA-UABJB, CIRA-Ic 2306 • same locality; submerged logs; 1 specimen, 72.1 mm SL; CIRA-UABJB, CIRA-Ic 2307 • Biata; river channel; –13.3919,

Figure 7. Some fish species recorded in the study area. **A, B.** *Loricariichthys platymetopon* (Dorsal and ventral) CIRA-Ic 2291, 122.2 mm SL. **C–E.** *Rineloricaria beni* (Lateral, dorsal and ventral) CIRA-Ic 2295, 63.4 mm SL. **F–H.** *Rineloricaria* cf. *castroi* (Lateral, dorsal and ventral) CIRA-Ic 2309, 141.7 mm SL. **I.** *Rineloricaria phoxocephala* CIRA-Ic 2314, 119.1 mm SL. **J, K.** *Sturisoma reisi* (Dorsal and ventral) CIRA-Ic 2316, 145.0 mm SL. **L.** *Batrochoglanis melanurus* CIRA-Ic 2322, 81.5 mm SL. **M, N.** *Microglanis* cf. *poecilus* (Lateral and left pectoral-fin spine) CIRA-Ic 2326, 75.9 mm SL. **O, P.** *Microglanis* cf. *zonatus* (Lateral and left pectoral-fin spine) CIRA-Ic 2327, 18.1 mm SL. **Q.** *Ituglanis* cf. *amazonicus* CIRA-Ic 2328, 31.9 mm SL. **R.** *Ituglanis* cf. *eichhorniarum* CIRA-Ic 2329, 36.3 mm SL. **S.** *Acaronia nassa* CIRA-Ic 2338, 105.1 mm SL. **T.** *Aequidens tetramerus* CIRA-Ic 2342, 86.8 mm SL. **U.** *Apistogramma erythrura* CIRA-Ic 2344, 38.3 mm SL. **V.** *Apistogramma similis* CIRA-Ic 2357, 33.1 mm SL. Scale bars: 10 mm except for **P** 5 mm.



–66.8912; 29.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 62.2 mm SL; CIRA-UABJB, CIRA-Ic 2308.

Identification. Four lateral plate series in longitudinal rows below the dorsal fin, the mid-dorsal series absent; caudal fin with only the superior unbranched ray extended as a filament; breeding male specimens with sexually dimorphic odontodes on the dorsum of the head and predorsal region; fins irregularly spotted or with a transversal distal band (Vera-Alcaraz et al. 2012); three longitudinal series of abdominal plates on the median complex (Pearson 1924).

***Rineloricaria* cf. *castroi* Isbrücker & Nijssen, 1984**

Figure 7F–H

Material examined. BOLIVIA – YACUMA/BENI • Yata; river channel; –12.7291, –66.0709; 18.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet15; 1 specimen, 141.7 mm SL; CIRA-UABJB, CIRA-Ic 2309.

Identification. Four lateral plate series in longitudinal rows below the dorsal fin, the mid-dorsal series absent; sexually dimorphic odontodes absent on dorsum of the head and predorsal region; tip of the snout pointed; five to seven longitudinal series of abdominal plates on the median complex (Vera-Alcaraz et al. 2012). *Rineloricaria* cf. *castroi* has the caudal fin with both unbranched rays extended as long filament (Vera-Alcaraz et al. 2012). In this specimen; however, the inferior unbranched ray is only slightly elongated.

***Rineloricaria phoxocephala* (Eigenmann & Eigenmann, 1889)**

Figure 7I

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 87.3 mm SL; CIRA-UABJB, CIRA-Ic 2312 – GENERAL JOSÉ BALLIVIÁN/BENI • Benicito; river channel; –13.0789, –66.5544; 20.IX.2023; A.R. Echeverria,

R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 2 specimens, 61.8–77.5 mm SL; CIRA-UABJB, CIRA-Ic 2313 • same locality; seine; 3 specimens, 72.2–119.1 mm SL; CIRA-UABJB, CIRA-Ic 2314.

Identification. Five lateral plate series in longitudinal rows below the dorsal fin, composed by the dorsal, mid-dorsal, median, mid-ventral, and ventral series; lateral plate of the mid-dorsal series consisting in two keeled plates situated around insertion of first ray of the dorsal fin (Vera-Alcaraz et al. 2012).

***Sturisoma reisi* Londoño-Burbano & Britto, 2022**

Figure 7J, K

Material examined. BOLIVIA – YACUMA/BENI • Yata; river channel; –12.7291, –66.0709; 18.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet 15; 1 specimen, 176.0 mm SL; CIRA-UABJB, CIRA-Ic 2315 • same locality; obs.; gillnet 25; 2 specimens – GENERAL JOSÉ BALLIVIÁN/BENI • Yata; dammed river channel; –13.4466, –66.7506; 28.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet 15; 2 specimens, 145.0–165.0 mm SL; CIRA-UABJB, CIRA-Ic 2316 • same locality; gillnet 35; 1 specimen, 155.0 mm SL; CIRA-UABJB, CIRA-Ic 2317.

Identification. Dorsolateral stripes dark, conspicuous; longitudinal, dark brown thin stripe on predorsal and nuchal plates not reaching origin of dorsal fin; dorsolateral stripes dark, conspicuous on both juveniles and adults; when present, stripes not united at origin of dorsal fin; central abdominal plates without spots (Londoño-Burbano and Britto 2024).

Family Pseudopimelodidae

***Batrochoglanis melanurus* Shibatta & Pavanelli, 2005**

Figure 7L

New record. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Benicito; river channel; –13.0789, –66.5544; 20.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 4 specimens, 60.2–81.5 mm SL; CIRA-UABJB, CIRA-Ic 2322 • Geneshuaya; river channel; –11.9052, –66.2601; 17.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay obs.; submerged logs; 1 specimen.

Identification. Having a homogeneous dark-brown caudal-fin coloration pattern (Shibatta and Pavanelli 2005).

Remarks. Previously, *B. melanurus* was known only from the type locality situated in the upper Rio Paraguai Basin, near the headwaters of the Rio Tapajós, a large tributary of the Amazon Basin, State of Mato Grosso, Brazil (Shibatta and Pavanelli 2005).

Figure 4G shows new records in Bolivia and the known distribution of *B. melanurus* in the Neotropical region (Jézéquel et al. 2020 v.2, GBIF.org 30 January 2025).

***Microglanis cf. poecilus* Eigenmann, 1912**

Figure 7M, N

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Biata; river channel; –12.9304, –66.6709; 20.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 27.5 mm SL; CIRA-UABJB, CIRA-Ic 2323 • Benicito; river channel; –13.0789, –66.5544; 20.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 8 specimens, 36.8–55.5 mm SL; CIRA-UABJB, CIRA-Ic 2324 • Biata; river channel; –13.4676, –66.8936; 29.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; cast net; 1 specimen, 28.8 mm SL; CIRA-UABJB, CIRA-Ic 2325 • same locality; submerged logs; 2 specimens, 62.8–75.9 mm SL; CIRA-UABJB, CIRA-Ic 2326.

Identification. Presence of a light transverse band on nape; lateral line short, not reaching the vertical line through middle of adipose fin; number of pores 3–9; tip of pectoral-fin spine undivided; caudal fin slightly bilobed; upper lobe of caudal fin more developed than lower lobe; anterior serrae of pectoral-fin spine antrorse; lateral line reaching the vertical through middle of dorsal fin base (Ruiz and Shibatta 2011). This species has a wide distribution in the Amazon and also has differences in color pattern. A study of these variations, including the application of molecular biology, will be able to show whether these morphological differences represent new species or just geographic variations (Shibatta 2013). In this study, a young individual of *Microglanis cf. zonatus* Eigenmann & Allen, 1942 (Figure 7O, P) was distinguished by having caudal fin rounded; all anterior serrae of the pectoral spine retrorse, except the last antrorse (Ruiz and Shibatta 2011).

Family Trichomycteridae

***Ituglanis cf. amazonicus* (Steindachner, 1882)**

Figure 7Q

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.7337, –66.3900; 21.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 31.9 mm SL; CIRA-UABJB, CIRA-Ic 2328.

Identification. Mottled color pattern formed by irregular to roughly roundish dark brown spots distributed on whitish background (Datovo and Landim 2005). This species is distinguished from *Ituglanis* cf. *eichhorniarum* (Miranda Ribeiro, 1912) (Figure 7R) by having fewer pectoral fin rays and shorter head length, 14.5–17.9 % of standard length vs. 18.9–25.0 % (Castro and Wosiacki 2017). The presence of *I. eichhorniarum* in the Bolivian Amazon was inconsistent with its actual known distribution (Dagosta and de Pinna 2019), and its presence certainty was classified as ‘to be verified’ by Jézéquel et al. (2020 v.2).

Order Cichliformes
Family Cichlidae

***Acaronia nassa* (Heckel, 1840)**

Figure 7S

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 3 specimens, 55.6–105.1 mm SL; CIRA-UABJB, CIRA-Ic 2338 • Benicito; river channel; –12.7337, –66.3900; 21.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 70.2 mm SL; CIRA-UABJB, CIRA-Ic 2339 – GENERAL JOSÉ BALLIVIÁN/BENI • Benicito; intermittent river channel; –12.9947, –66.5342; 22.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay obs.; submerged logs; 1 specimen.

Identification. Presence of two dark spots in the region between the infraorbitals and the external portion of the preoperculum, one closer to the orbit and another in the external portion of the pre-operculum. However, in individuals captured in dark waters, these spots are inconspicuous. In addition to the medio-lateral spot, located in the median part of the flank below of the anterior branch of the lateral line, and of a small spot in the upper part of the caudal peduncle, this species has two other characteristic spots: one positioned posteriorly to the operculum and another in the superior-posterior region of the orbit (Graça et al. 2013).

***Aequidens tetramerus* (Heckel, 1840)**

Figure 7T

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet25; 1 specimen, 99.5 mm SL; CIRA-UABJB, CIRA-Ic 2340 • Benicito; river channel; –12.7337, –66.3900; 21.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 86.8 mm SL; CIRA-UABJB, CIRA-Ic 2342 – GENERAL JOSÉ BALLIVIÁN/BENI • Benicito; river channel; –13.0789, –66.5544; 20.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 58.5–59.5 mm SL; CIRA-UABJB, CIRA-Ic 2341.

Identification. Spot on the dorsal region of the flanks absent or joined to the medio-lateral spot; caudal fin covered with scales up to $\frac{3}{4}$ of its length; absence of dark spot on the margin of the flank scales; continuous, narrow lateral band, restricted to a series of scales; 24 or fewer scales in the series of scales immediately dorsal to those containing the scales of the posterior branch of the lateral line (series E1) (Graça et al. 2013).

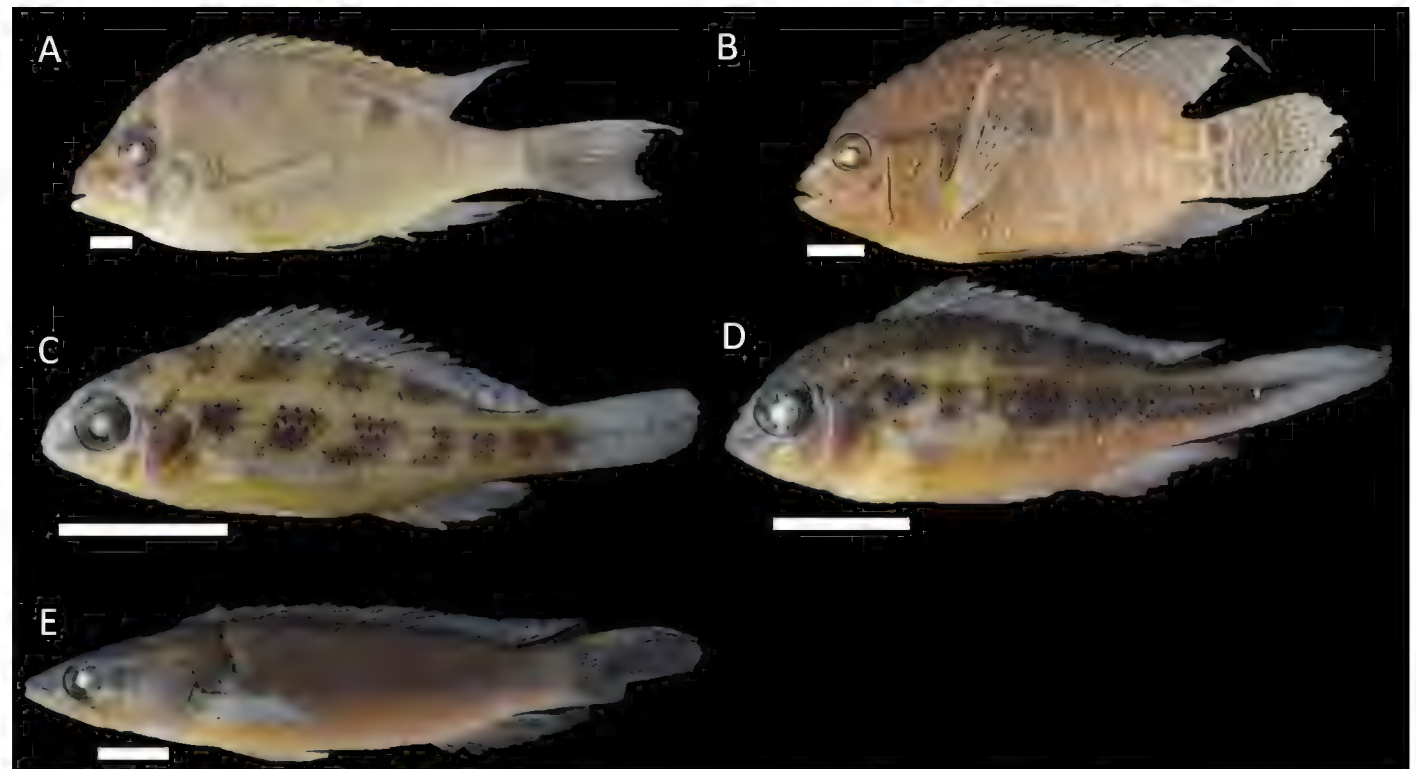
***Apistogramma erythrura* Staeck & Schindler, 2008**

Figure 7U

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 4 specimens, 17.5–23.4 mm SL; CIRA-UABJB, CIRA-Ic 2343 – GENERAL JOSÉ BALLIVIÁN/BENI • Geneshuaya; river channel; –11.9052, –66.2601; 17.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; submerged logs; 3 specimens, 27.9–44.8 mm SL; CIRA-UABJB, CIRA-Ic 2344 • Benicito; river channel; –13.0789, –66.5544; 20.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 24 specimens, 17.2–32.8 mm SL; CIRA-UABJB, CIRA-Ic 2345 • same locality; seine; 3 specimens, 26.3–37.2 mm SL; CIRA-UABJB, CIRA-Ic 2346.

Identification. Having a reduced number of 3 infraorbital pores; lateral band is broad in the caudal peduncle, but narrows toward the head; adult male usually with extended anterior dorsal fin lappets, and a bright red round caudal fin; lacking any abdominal marking below the lateral line (Staeck and Schindler 2008). *Apistogramma similis* Staeck, 2003 (Figure 7V), only one congener collected in the study area has a complete set of 4 infraorbital; a lateral band is broken into flank spots, and a distinctive caudal spot clearly separated from the lateral band; low and even dorsal fin, and round caudal fin; abdominal streaks are modified into horizontal abdominal stripes (Wise 2021). *Apistogramma similis* belongs to the *A. commbrae* (Regan, 1906) complex, in which this species can be distinguished from other members by having the vertical rows of

Figure 8. Some fish species recorded in the study area. **A.** *Biotodoma cupido* CIRA-Ic 2365, 111.8 mm SL. **B.** *Cichlasoma boliviense* CIRA-Ic 2372, 75.9 mm SL. **C.** *Crenicara latruncularium* CIRA-Ic 2374, 32.4 mm SL. **D.** *Crenicara punctulata* CIRA-Ic 2375, 37.7 mm SL. **E.** *Saxatilia santosi* CIRA-Ic 2393, 81.6 mm SL. Scale bars: 10 mm.



spots on the caudal fin, and 16 dorsal fin spines (Wise 2006).

***Biotodoma cupido* (Heckel, 1840)**

Figure 8A

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet15; 1 specimen, 69.3 mm SL; CIRA-UABJB, CIRA-Ic 2361 – GENERAL JOSÉ BALLIVIÁN/BENI • Geneshuaya; river channel; –11.9052, –66.2601; 17.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet15; 1 specimen, 67.7 mm SL; CIRA-UABJB, CIRA-Ic 2362 • same locality; seine; 1 specimen, 44.8 mm SL; CIRA-UABJB, CIRA-Ic 2363 • Benicito; river channel; –12.8081, –66.4860; 21.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet15; 3 specimens, 65.2–65.9 mm SL; CIRA-UABJB, CIRA-Ic 2364 • same locality; gillnet25; 3 specimens, 104.9–111.8 mm SL; CIRA-UABJB, CIRA-Ic 2365.

Identification. Dorsal fin with 15 spines and 9–11 soft rays (Kullander et al. 2018).

***Cichlasoma boliviense* Kullander, 1983**

Figure 8B

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIÁN/BENI • Biata; river channel; –13.1786, –66.7364; 19.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; gillnet25; 1 specimen, 88.6 mm SL; CIRA-UABJB, CIRA-Ic 2368 • Biata; intermittent river channel; –13.3384, –66.8181; 26.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 72.7 mm SL; CIRA-UABJB, CIRA-Ic 2369 • Yata; intermittent river channel; –13.5918, –66.8584; 27.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine gillnet; 1 specimen, 58.6 mm SL; CIRA-UABJB, CIRA-Ic 2370 • Yata; dammed river channel; –13.5005, –66.8602; 27.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 59.2–67.5 mm SL; CIRA-UABJB, CIRA-Ic 2371 • Biata; river channel; –13.3919, –66.8912; 29.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; electro-shocker; 6 specimens, 13.4–75.9 mm SL; CIRA-UABJB, CIRA-Ic 2372 • same locality; seine; 1 specimen, 68.5 mm SL; CIRA-UABJB, CIRA-Ic 2373.

Identification. Of the 13 currently valid species in the genus, only *C. boliviense* is thought to be distributed in the Madeira River Basin (Ottoni 2011, Graça et al. 2013).

***Crenicara latruncularium* Kullander & Staeck, 1990**

Figure 8C

Material examined. BOLIVIA – YACUMA/BENI • Benicito; river channel; –12.4041, –65.9567; 16.IX.2023; A.R. Echeverría, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 32.4 mm SL; CIRA-UABJB, CIRA-Ic 2374.

Identification. *Cichlasoma latruncularium* can be distinguished from *Crenicara punctulata* (Günther, 1863) (Figure 8D) by serrated instead of smooth supracleithrum and color pattern; the second to fourth blotches along the middle of side are anteroventrally extended, the blotches along the back are as distinct as those along the middle of the side (Kullander and Staeck 1990).

***Saxatilia santosi* (Ploeg, 1991)**

Figure 8E

Material examined. BOLIVIA – GENERAL JOSÉ BALLIVIAN/BENI • Biata; river channel; –13.1786, –66.7364; 19.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; electro-shocker; 1 specimen, 81.6 mm SL; CIRA-UABJB, CIRA-Ic 2393 • same locality; seine; 1 specimen, 66.8 mm SL; CIRA-UABJB, CIRA-Ic 2394 • Benicito; river channel; –13.0789, –66.5544; 20.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 2 specimens, 67.8–84.3 mm SL; CIRA-UABJB, CIRA-Ic 2395 • Yata; river channel; –13.4493, –66.6004; 25.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 1 specimen, 81.4 mm SL; CIRA-UABJB, CIRA-Ic 2396 • Biata; river channel; –13.4676, –66.8936; 29.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; hand net; 1 specimen, 28.3 mm SL; CIRA-UABJB, CIRA-Ic 2397 • same locality; seine; 2 specimens, 26.2–29.8 mm SL; CIRA-UABJB, CIRA-Ic 2398 • Laguna Dos Naciones; lake; –13.5753, –66.8963; 30.IX.2023; A.R. Echeverria, R.B. Cholima, T. Yunoki, F.R. Cuaniay leg.; seine; 1 specimen, 65.8 mm SL; CIRA-UABJB, CIRA-Ic 2399.

Identification. Presence of a humeral blotch; humeral blotch well below lateral line in adult, situated in position of longitudinal band in juveniles; range in number of scale-series below lateral lines 46.6–50.7; range in number of scales between posterior scales in upper lateral line and dorsal fin 2.41–3.08 (Ploeg 1991, Varella et al. 2023).

DISCUSSION

Our fish surveys in poorly known areas discovered seven new records for Bolivia. Most of these species were previously collected in black-clear water streams located in the Upper Amazon and/or the lowlands around the Guiana Shield and Brazilian Shield, far from the study area.

Among these seven new records, the five catfish species (*Spinipterus* cf. *acsi*, *Tatia* cf. *gyrina*, *Cetopsidium orientale*, *Nemuroglanis* cf. *furcatus*, and *Batrochoglanis melanurus*) were found exclusively inside crevices in dead submerged logs (a microhabitat difficult for catching fish). Therefore, we do not reject the possibility that future research may reveal additional records from the midpoints between previous and current observations.

These new records in the Llanos de Moxos, far from previous observations, may be explained by the large turbid rivers originating from the Andes. These rivers provide an uninterrupted habitat in most of the Amazonian lowlands, which act as dispersal barriers, isolating their suitable habitats (i.e., black-clear water streams) (Albert et al. 2011; Jézéquel et al. 2020).

Although the main rivers of the upper Madeira Basin are thought to be well-sampled ichthyologically, the discovery of seven new records in poorly known areas suggests that continuing to fill some gaps and improve the quality of the occurrence dataset in the center of Llanos de Moxos is essential for understanding the real fish diversity in Bolivia. Overall, the habitat diversity in the Llanos de Moxos, a vast savanna floodplain in the Bolivian Amazon, is crucial for maintaining its rich biodiversity. We hope that the creation of the Río Yata Ramsar site contributes to protecting its unique ecosystem from threats such as deforestation, climate change, and human activities.

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ADDITIONAL INFORMATION

Conflict of interest

The authors declare that no competing interests exist.

Ethical statement

No ethical statement is reported.

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Author contributions

Conceptualization: TY, GMC, ARE, RBC. Data curation: TY, ARE, RBC. Formal analysis: TY. Funding acquisition: GMC, FAM. Investigation: ARE, RBC, TY. Methodology: GMC, ARE, RBC, TY. Resources: GCM, FAM. Supervision: GMC, FAM. Project administration: GMC, FAM. Software: TY. Validation: ARE, GMC. Visualization: TY, ARE, RBC. Writing – original draft: TY, ARE, RBC. Writing – review and editing: TY, ARE, RBC, GMC, FAM.

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Data availability

All data that support the findings of this study are available in the main text and the Supplemental materials.

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SUPPLEMENTAL MATERIALS

Table S1. Occurrence data of fish recorded from the tributaries of the Beni and Mamoré Rivers: Biata River, Geneshuaya River, Benicito River, Yata River and Dos Naciones Lagoon, 16–30 September 2023. Available online.